MOTOR BOATING

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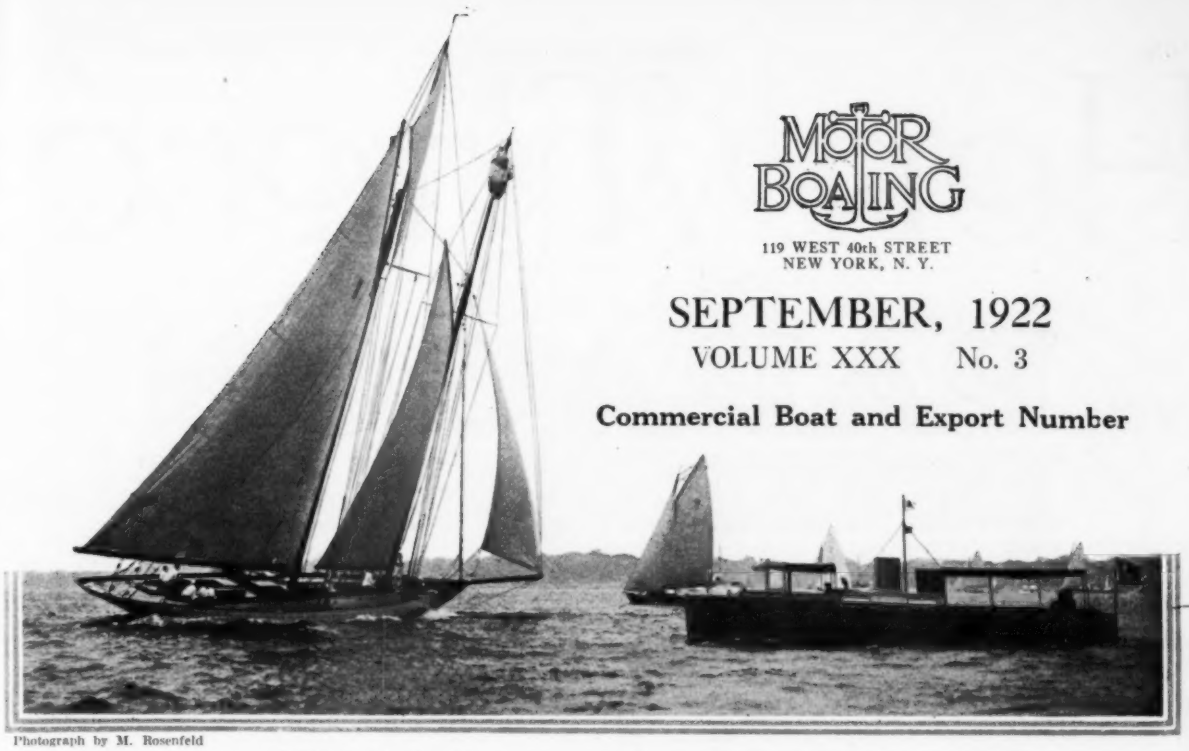

Photograph by M. Rosenfeld

This is the life which no one can resist once he gets a taste of it

COMMODORE GAR WOOD, President of the Yachtsmen's Association of America, has appointed the race committee for the International Motor Boat Sweepstakes, the 150-mile runabout event for $25,000, to be run in Detroit, September 3, 1923. Commodore Wood has selected Commodore Frederick R. Still, Detroit Yacht Club, chairman. Commodore Still, as chairman of the regatta committee for the Gold Cup, has had charge of the races which have made Detroit famous in the motor boat speed world.

Commodore Still will have four assistants. Colonel S. D. Waldon, President of the Detroit Automobile Club, the Detroit Aviation Society and an automotive engineer of note, will serve with him, also W. D. Edenburn, who has been in charge of timing and scoring of the Gold Cup regattas. Both of these men are Detroiters. Charles F. Chapman of New York, Secretary of the Racing Commission of the American Power Boat Association, and Webb Jay of Chicago, one of the men who starred in the early automobile races and later in motorboat races, are the other members of the committee.

These five men will have complete charge of the running of the 150-mile event for the largest purse in the history of aquatic speed events. The boats will be displacement runabouts limited to a maximum engine cylinder capacity of 1,350 cubic inches, a minimum length of 25 feet and beam of five feet, with a passenger capacity of not less than two.

The program for the annual Gold Cup regatta, Sept. 1, 2, 3 and 4, has been completed by the regatta committee. There will be nine events run during the four days with eleven trophies offered, as two of the trophies are for extreme speeds in other events.

The following events will be run off in three heats, on Friday, Saturday and Monday, Sept. 1, 2 and 4: Gold Cup, 90 miles; Detroit Trophy, 90 miles; Wood-Fisher Trophy, 150 miles; Sallan Trophy, 75 miles; Motor Yacht Trophy, 75 miles. The total distance is given in each case. The Sunday events, in addition to the Ladies' race, are: Commodore Chas. W. Kotcher Trophy, 20 miles; The Detroit News Trophy, 20 miles; Miller Chance race, 10 miles. The Detroit Times Trophy is offered for the fastest heat in the Gold Cup, and the H. C. Stutz Trophy for the fastest heat in the Detroit Trophy race.

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Commercial boating on the Thames, London, England. House of Parliament in background

A tobacco barge in Turkey

Fishing boats of Marseilles, France

Photos by Brown Bros. and Underwood & Underwood

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Everywhere

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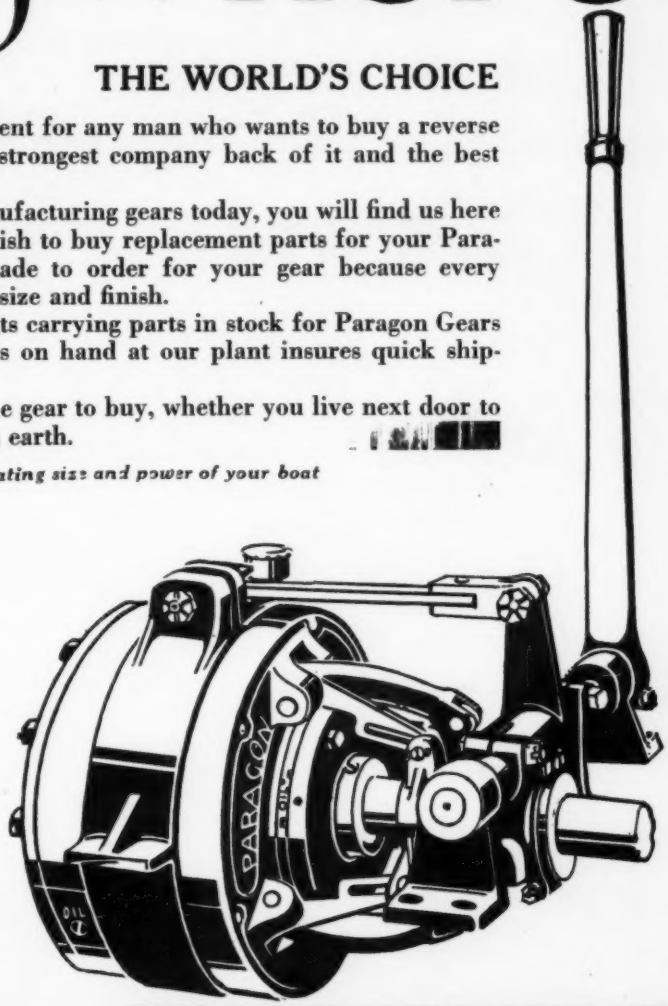
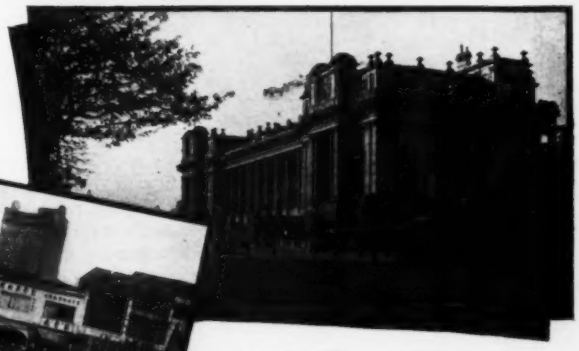


An ancient mission in South America

Motor boats with American engines and Paragon Gears compete with native craft in carrying the commerce of China



Federal Parliament Building, Melbourne, Australia. Many Paragon Gears are used in this distant continent.

Photographs by Underwood & Underwood

North in the Summer

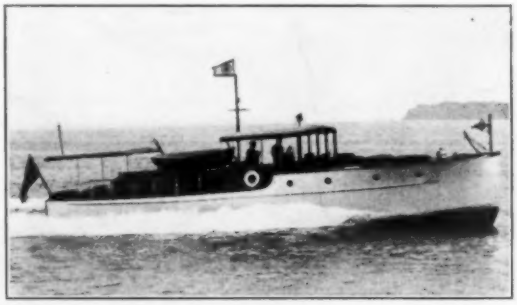
South in the Winter

30 Footer—*45 Miles an Hour*—Price $5000

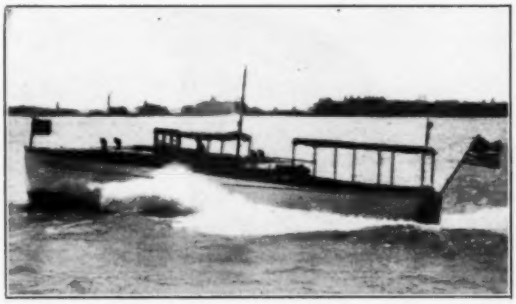
A 30-FOOT runabout, staunchly built for long life, designed with high freeboard, double planked bottom, batten seam sides for seaworthiness, with accommodations for a party of eight in the cockpits forward and aft, and powered with a 300 H.P. engine for a turn of speed of 45 miles an hour.

While a fast turn of speed is available, the 30-footer is not built as a speed boat, but designed for continuous pleasure service. A gentleman's runabout throughout, completely equipped in every respect, ready for operation; a pioneer type in naval architecture; and an outstanding economic achievement.

Bulletin No. 223, describing the 30-footer, will be of interest to you.



The 54-foot Standardized Express Cruiser reflects the utmost obtainable in a motor yacht; seaworthy, safe, with accommodations for a party of eight and a crew of two, and with a speed of 25 miles an hour; a cruiser without a competitor. Send for Bulletin No. 221.



While the standardized 42-footer is termed essentially a day express cruiser, it has accommodations for a party of four for extended cruising; a boat which reflects the most perfect sense of proportion in the distribution of space; speed 22-24 miles an hour. Send for Bulletin No. 222.

Immediate deliveries may be had

GREAT LAKES BOAT BUILDING CORPORATION

Milwaukee, Wisconsin

Largest Builders of Express Cruisers in America

Advertising Index will be found on page 146

MOTOR BOATING

A close start of the 15-mile race for single engined hydroplanes

Rare Sport at Chicago

Pageant of Progress Races at the Windy City Attract Big and Little Speed Boats From All Parts of the Mid-West

By Vera Thomas Griffith

EVER since the time old man Noah took a squint at his home-made barometer and turned his attention to parking the Ark somewhere in out of the wet, Man The Mariner has run a never-ending race in which he has had the elements as his strongest rivals.

The day that Commodore Sheldon Clark completed the entry list for the Pageant of Progress races at Chicago, August 3 to 6, and smiled to himself thinking of the sport to come, the god who operates the rain spigots and the wind machines on high chuckled and unbeknownst to the commodore, slyly slipped in a couple of entry blanks bearing the names of the weather twins, Wind and Wave.

And when the big and little speed boats from all parts of the mid-west lined up for a start Thursday afternoon, August 3, Wind and Wave were right among 'em and gave the water racers the struggle of their lives for the three days scheduled for the regatta and two additional days. Friday afternoon, the early part of Sunday afternoon, when a rain squall passed over, and Monday afternoon the elements were victorious and drove the doughty little speedsters to cover on the pier; but Thursday afternoon, Saturday afternoon and the latter part of Sunday afternoon when Wind almost died, the boats rode right over Wave.

Mrs. Ethel S. Hanley who piloted her hydroplane Ethel X to victory

So despite the disturbers the program of races was carried to a highly successful finish.

Both boats and boatmen were somewhat battered by the buffeting, but only one real casualty resulted. This was the overturning and sinking of Baby Sure Cure, the Detroit rival of Miss Chicago, owned by Paul Strassburg. The accident occurred on a trial run in the morning of the second day, when the boat ran down a ground swell and made a sensational leap and dive such as would put to shame the most daring aquatic performer. Strassburg was not in the boat, and the mechanician, who was driving at the time, and his assistant, were not seriously injured. The sunken hull was towed back to the pier, damaged to such an extent that repairs for a re-appearance on the course were found to be impossible. The mishap was one of the

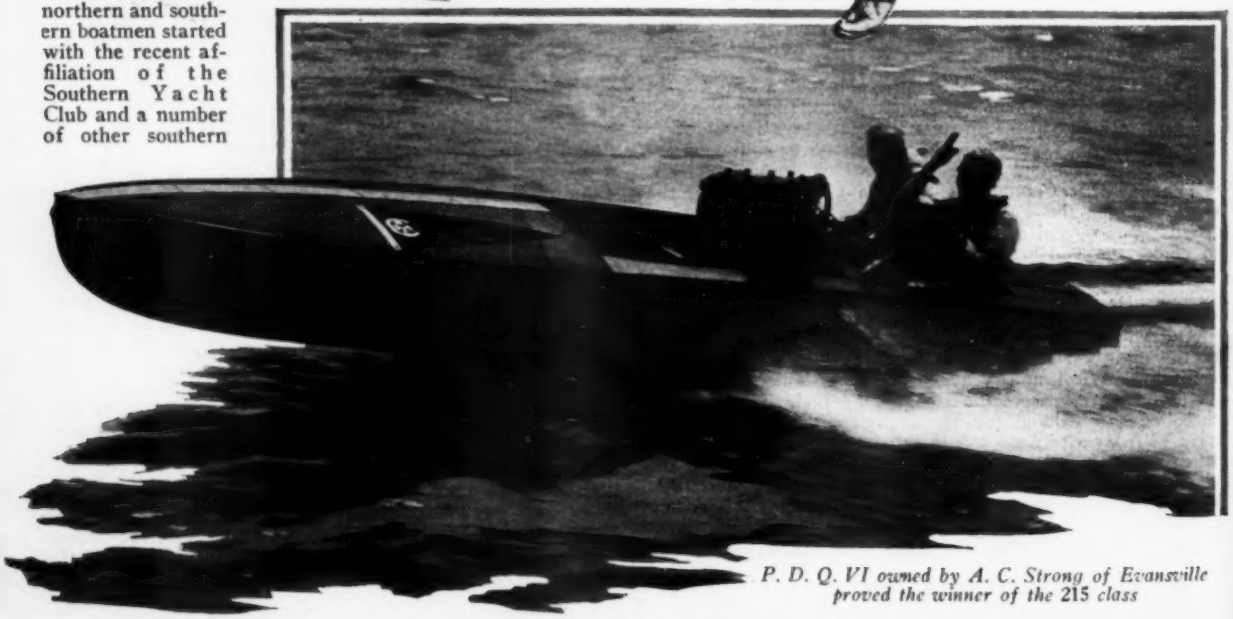
many exciting thrills of the interesting regatta.

Another thrill came on Saturday when Miss America I, Gar Wood's wonder craft, broke her own record for a circular course, covering the two and one-half miles in the last lap of the Great Lakes Speed Championship event in 2.12, or at a speed of 68.18 m.p.h. The closest approach to this record was reached by Baby Sure Cure in the fifth lap of the free-for-all single engine hydroplane race of Thursday, when the Detroit entry ripped around the circle in 2.18. On a straightaway Miss America I, twin-engine champion of the world, has a near 80-mile-an-hour speed record. To many, the most interesting feature of the regatta was the meeting of the North and South on the water course, marking the first appearance of a southern speedster in Mississippi Valley Power Boat Association events. The boat from the South was Miss Dubonnet, entered and driven by Captain Charles Ferran of New Orleans, La., prominent member of the Southern Yacht Club of that city. Miss Dubonnet is the former Miss Detroit I, and this was her first real race under her new cognomen, as she had had no rival in southern waters. Bad luck trailed her, however, starting with the first heat of the Single Engine free-for-all, when she encountered a block of wood, which rammed a hole through her hull which was not satisfactorily repaired during the regatta period. This injury influenced Captain Ferran in hesitating to accept definitely Commodore Wood's invitation to enter Miss Dubonnet at the Detroit races, although it is possible he may reconsider, and a southern craft may again race on her first home waters.

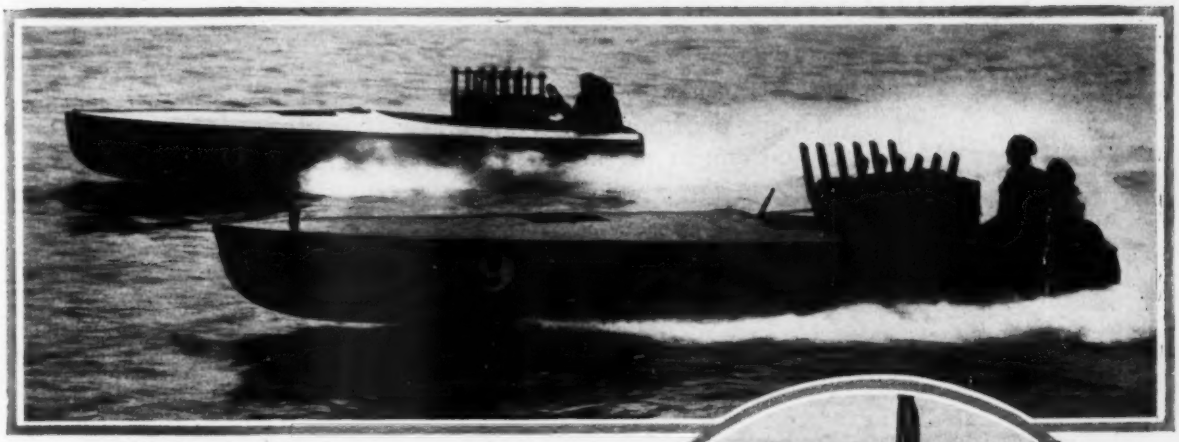
The alliance of northern and southern boatmen started with the recent affiliation of the Southern Yacht Club and a number of other southern boating organizations with the M. V. P. B. A., and was further cemented by the acceptance of the invitation to hold the winter Valley meet, along with a regatta, at New Orleans in February. This invitation had been tendered at Peoria in July by W. H. Parham, secretary-treasurer of the Southern Yacht Club, and taken under advisement by the M. V. P. B. A. directors. At a sort of continued-in-our-next meeting of these directors, held at odd moments during the racing program, acceptance was given to Mr. Parham, who is himself one of the directors. The announcement of the proposed southern meeting

Janet Virginia owned by Walter Plummer competed in the 705 class

Three notables at Chicago, Commodores Sheldon Clarke, Webb Jay, and Gar Wood



P. D. Q. VI owned by A. C. Strong of Evansville proved the winner of the 215 class



Miss Chicago and Fore in an exciting brush

was hailed with delight by all of the boating fraternity. Parham, with characteristic energy, started to secure entries immediately, and set out on his return to the South, with a score or more of entry blanks, signed by all the big fellows, and not a few of the smaller ones, nestling in his coat pocket. It is the plan of the boatmen of the South to hold the regatta at the time of the famous Mardi Gras carnival.

The Chicago regatta, under the auspices of the M. V. P. B. A., was the second one held in conjunction with the Pageant of Progress, the monster civic exposition which, since its successful inauguration last year by Mayor William Hale Thompson, has become an annual event in the Windy City. Arrangements were similar to those of last season, the course being laid out inside the break-water on the north side of the Municipal pier, and a part of the lower level of the pier being transformed into a big boat shop, where, from sun-up to sun-down and oft in the stilly night, repairs on battered hulls and refractory engines went busily forward, and boat drivers, owners, mechanics, and writers swapped reminiscences and prophesies. Newcomers and old-timers alike stepping into the enclosure for the first time were apt to rub their eyes and look again, for the number of hydroplanes resting upon their cradles was so great as to seem founded on fancy rather than fact. Where, at previous regattas, the entries in the big free-for-all classes had numbered one, two or three, with possible additions stepping up from the lower classes, here there were no less than seven. Up from Peoria and Pekin, via the Illinois and Michigan canal, had come two barges bearing ten contestants for the smaller classes, and, to jump ahead a bit, back to Peoria and her sister city went not only barge and boats, but a big share of the class purses besides.

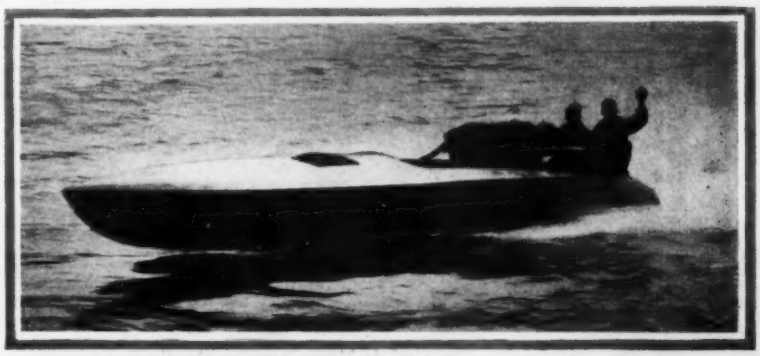
Seats for the spectators had been arranged on the second level of the pier for its entire length and, for the most part, were filled to capacity, although, because of a street car strike, on at the time, the attendance did not reach the record-breaking figures of the preceding year. Given a taste for boat racing last season, Chicago crowds watched this year's events with eagerness, hailing last year's contestants as old friends.

The barge for the officials was anchored inside the course, facing speed boat headquarters. Here Starter J. W. Sackrider summoned contestants to score

(*Continued on page 62*)

It was an easy matter to change a propeller

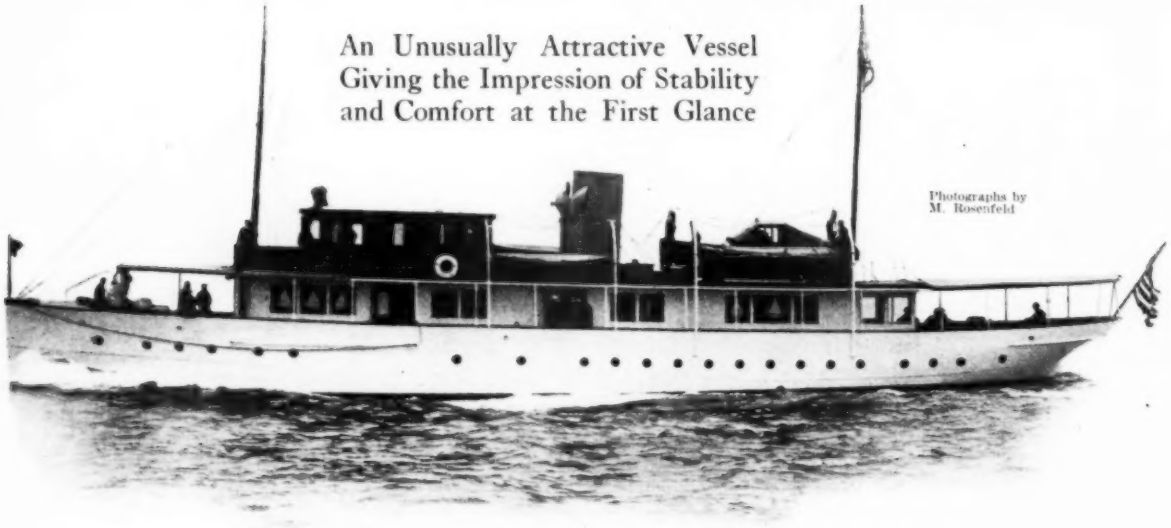
Miss Peoria in the baby or 151 class competed in higher classes also



Baby Sure Cure which won the first day's race in the free-for-all

Cynthia, a Twin Screw Diesel Yacht

An Unusually Attractive Vessel Giving the Impression of Stability and Comfort at the First Glance



Photographs by M. Rosenfeld

Cynthia moves along at over thirteen knots and exceeded the designer's promise by a good margin

THAT the steam yacht of both the offshore and coastwise cruising types, as well as the large expensive-to-operate gasoline driven craft, are rapidly being replaced by more modern vessels powered with full Diesel engines is convincingly shown by the fact that another yacht of this type has just been completed. Due to the large crew requirements of the steam craft and the heavy fuel expense of the gasoline craft, vessels of this type are losing their prestige. One of the oldest members of the New York Yacht Club, Commodore Merrill B. Mills, of Detroit, Mich., has just taken over his new yacht Cynthia, completed for him by the Tebo Yacht Basin Co., Inc., of Brooklyn, built from designs and under the supervision of Cox & Stevens, the New York naval architects.

Cynthia has been particularly adapted for offshore cruising. Her construction is entirely of steel and exceptionally heavy. The generous free board and high bulwarks forward make her seaworthy and able. An elliptical type stern, similar to that provided on steamships, has been built on. In her length of 129 feet, many unusual accommodations have been provided without crowding or omitting any desired features. The beam has been kept to 23 feet, while the draft has been limited to 6½ feet.

A pair of six-cylinder four-cycle full Winton-Diesel engines have been provided which yield from 225 to 250 h.p. each. Due to this twin screw installation, her speed is over thirteen knots which is decidedly better than the designers had anticipated. Ample fuel tankage is provided so that

The steel deckhouse contains the dining saloon at the forward end

The combined smoking room and owner's office, also in the deckhouse

thirty odd tons of oil may be carried, on which nearly 4,000 miles can be covered at cruising speeds. Auxiliary machinery consisting of two Winton generating sets, one of 7½ k.w. and the other of 5 k.w. capacity are installed so that ample current for operating air compressors, charging batteries, bilge pumps, boat hoists, windlasses, etc., will be available at all times.

All conveniences have been installed on the vessel, including a hot water heating plant, since the boat will be used throughout the year by her owner. He plans to cruise in Northern waters during the summer and in Florida and the West Indies during the winter season. The accommodations on Cynthia will be unusual. Her main deck house, which is of steel, contains the dining saloon in the extreme forward portion. An inside passageway leads past the machinery enclosure to the owner's combined office and smoking room and to the equally large living room in the after end. This will have access to the after deck by means of large

The lounge and music room are at the after end of the deckhouse

double doors. The after deck is very spacious and, at the extreme tip of the stern, a very comfortable wide stern seat has been built in.

Accommodations below decks consist of a large owner's stateroom amidships with bathroom and wardrobe adjoining.

The pilot house and all exterior trim will be of teak wood. Interior finish is a departure from convention in that no hard wood has been used. All rooms are cheerfully finished in enamel with hangings to harmonize. All ports throughout have been equipped with the Smithson port holes, which are easily opened.

The owner's stateroom is attractively furnished and decorated

Steve, steering up the Chagres River

A Likely Story

Hippocampus, Following the Route of the Spanish Explorers Up the Chagres River, Fishes in the Finest Tarpon Grounds in All the World

By Alfred F. Loomis

Photographs by S. C. Russell and the author

AS this is to be a story about fishing, it is well to start it off by repeating the likeliest fish story that has ever been spun in the cockpit of the auxiliary yawl Hippocampus. There were several of us perched around the pit with our feet under us or in front of us, according to whether they were nude or shoed, with our glances bent toward the refracted beams of the setting sun to northwestward of us, and our brains searching far afield for novelties in the piscatorial realm.

I had just told the true story of the way they catch fish in Kingston Harbor, Jamaica, and it is worth chronicling here that they spread a sort of tennis net above a rowboat and make the fish jump into the net by frightening them. Jo, who is Mrs. Loomis, believed me, but our visitors drew a chorus of deep breaths and kept their eyes riveted to the retiring sun. Then one of the boys asked me whether I was aware that the fishermen of Panama Bay had established a wireless system of communication with the fish. I was not, but he explained to my satisfaction that the natives locate schools of mackerel by placing an ear to the butt of an oar and listening to the vibrations emitted by the schools as they recite their A B C's in Morse code.

Whereupon another ardent Walton delivered himself of the yarn which will still rank high when all the fish stories of the world are told.

"I had a little work to do on my engine," he began, "and dropped a line over the side so that my time wouldn't be wasted. It wasn't long before I heard a dull thumping sound in the planking of the boat, as if a bell clapper was striking wood instead of bronze. At first I paid no attention to it, but as the noise kept up I thought someone must have come alongside in a *panga*. I went topside and looked around, but there wasn't a small boat within fifty yards of me. So I dropped below and started work again.

"Presently the thumping noise began again and kept up for just about the length of time that a telephone rings in your home. Then it stopped and started again.

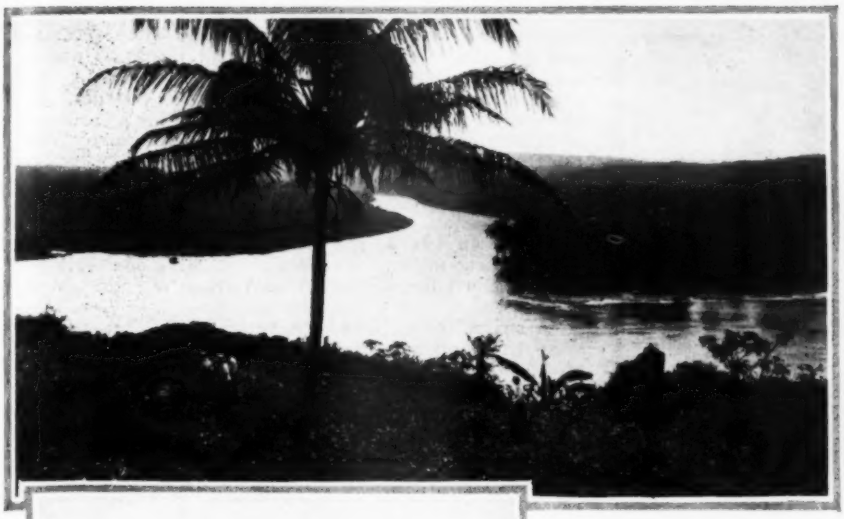
"'By jingo,' I said to myself, 'someone sure is trying to get me by submarine telephone.' So I went on deck again and happened to see my fish line swishing back and forth in the water. I laid my hand to it and felt the vibrations just as plain as plain — brrrrr-brump-brump, brrrrr-brump-brump — just like a telephone. Well, sir, I hauled in the line and if there wasn't a grunter on the hook. Evidently he'd been hooked for some time and was tired of waiting for me to come and tend my line. Now what do you think of that for a true story?"

I thought so well of it that I determined to do a little fishing on my own hook in this Panamanian paradise of fishermen. But where to fish first? In the Pearl Islands, we were told, the fish bite so fast that you have to throw half of them back to keep them from swamping the boat. At Otoque Island, which lies twenty miles south of the Pacific entrance to the canal, you bait your hook with a five-pound mackerel in order to catch a two hundred-pound jewfish, and you have to plug up the hawse pipes to keep the corbina from climbing aboard.

But in the Chagres River on the Atlantic side, the tarpon become so frantic at the sight of a Wilson spoon that all the other denizens of the muddy stream jump the banks and hide themselves in the jungle.

Weighing the enticements of one fishing ground against another, I finally decided to take my initiation into the rites of tropical fishing in the Chagres River, and to that end altered an itinerary which was tentatively set forth in the preceding article of this series. Before cruising to the San Blas country or to Cartagena it was determined that I would take aboard a party of Canal Zone fishermen, and, leaving Mrs. Loomis ashore for the day, beard the voracious tarpon in his very den.

So on a certain Saturday, Hippocampus dropped down through Gatún locks, near which she had lain for ten months in idleness, and made fast for the night alongside a pier in Cristobal, on the Atlantic side. At 6:30 of Sunday morning



Mouth of the Chagres River from Fort Lorenzo

Watch tower and ruined walls of Fort Lorenzo

the band of fishermen assembled, bringing stout poles of native wood, multiple reels, creels, and all the paraphernalia of tarpon fishing, and when a water-cooler had been securely lashed in the cockpit we cast off and headed for the open sea.

If I appear to have exaggerated in preceding paragraphs I may say now in all sobriety that the Chagres River is the place of all others where tarpon fishing is the king of sports. You may go if you wish to Useppa Island, on the west coast of Florida, and troll in the rough water of the passes for the elusive game fish, braving the agonies of seasickness and the hazard of being overturned in your canoe; but if you wish fishing de luxe you must come to the Panama Canal. Here you stand on the slippery apron of the Gatun spillway, your feet shod in hobnailed boots, the swift current of the stream swirling about your ankles, and your line cast out to the turmoil below, where tarpon jump against the dark background of tropic jungle. Or you may ascend the river by small boat as we did to within half a mile of the spillway apron and troll back and forth along a reach whose bottom is carpeted with the big fish. The quarry is there lying in wait for the small fry which are stirred up when the spillway gates are opened, and only a combination of skill and luck is required to bring it to the gaff.

Very well. My companions had the skill and I felt confident that I could furnish the luck. Hitherto, I have always had all kinds of luck at fishing except the good kind—but I have never fished in the right place. Since the Chagres River is the right place, I knew that my luck would turn. So off we started in high spirits, the motor kicking us into the teeth of the trade wind until we had come to the entrance between the jetties. There we made sail, shut off the motor, and ran with the wind for the old Spanish Fort Lorenzo.

Now there is very little love lost between me and the Spaniards who discovered and settled the Caribbean shore in the sixteenth century. For their part, most of them are dead and reposing with the saints, so that they have little inclination to bestow affection on me, and for my part, I think they were perhaps a shade too severe with the natives. It was all very well for the Conquistadores to seek to impose Spanish manners and morals on the Carib Indians, but when they roasted them over slow fires or parboiled them in oil, I think they asserted their civilization too emphatically.

But in spite of a slight coolness which a hasty perusal of Central American history gives me, I entertain the highest admiration for the Spaniards as explorers. Cruising a strange, hostile coast in ships which would rank low according to modern standards of seaworthiness, and through waters which, for all they knew to the contrary, might engulf them or spew gigantic sea serpents at them, they nevertheless discovered everything

The old bridge at Panama, across which Capt. Morgan led his buccaneers to sack the city

Bert, wearing the deadly look of an inveterate tarpon fisherman

along the shore that was worth discovery. In every natural harbor they established a settlement, and at every river mouth they built a fortress, and to make their discoveries they had to employ detailed, painstaking methods.

The mouth of the Chagres, for instance, is not distinguishable from its adjacent shoreline at a distance of three miles, and when making it from the eastward and close to, one is liable to sail right past without seeing it. Nowadays there is the headland on which stand the ruins of Fort Lorenzo to guide one, as well as a cocoanut plantation on the southern side of the river mouth. But it is doubtful whether the plantation grew there four hundred years ago, and it is highly improbable that the first Spaniards found Fort Lorenzo before they built it. From the absence of which landmarks I deduce that the explorers knew their business.

But my companions, all of whom had visited the locality before, knew their way in across the bar as exactly as any early Spaniards, and when we had sailed for little more than an hour, they gave the word to lower sail and go in under power. Contrary to my usual candid practice, these companions shall be nameless, except for nicknames, and I wish that I too might be anonymous for this one article. For on this short but rough run in the open Caribbean I experienced the first pangs of seasickness that I have ever felt aboard Hippocampus, while one of the quintette of hale and hearty visitors succumbed entirely. Wherefore, this one sought his ease while the rest of us doused the mainsail, started up the little Palmer engine, and made for quiet water.

Once around the bluff which marks the east shore of the river mouth, the wind failed us and we lowered jib and jigger as well. Then I had time to look about me and thank a benign Providence that I did not have to ascend the Chagres River in the days when Fort Lorenzo actively guarded the approach to the gold city of Panama. From my contemplation of the precipitous sides of the headland and the crumbling ruins of the ancient fortress I was recalled by the whir of a fish reel.

"Stand by for a strike and a seventy-five-pounder," said my seasick companion, who had recovered his aplomb with surprising celerity and was casting his line astern. "Anything smaller is thrown back, as we don't have to keep the minnows."

I marvelled greatly as another rod was unlimbered and a hand line was trailed astern. We were now trolling with three Wilson spoons, and the dinghy and I felt my heart hammer with the tensity of the situation. Soon we would have to climb the rigging to keep from trampling on the fish.

"A strike," called Bert. "A regular whale."

All hands glanced astern. Bert heaved until his lignum vitae pole bent, and his eyes gleamed with the glint of battle. Suddenly my attention was attracted by the queer performance of the dinghy. It seemed to want to turn its stern upstream and point its unwinking eyes toward the scene of the conflict far behind us. Slowly Bert wound in and slowly the dinghy swung around. When it seemed that the tarpon must break water right ahead of us, it shook the hook from its mouth and the line came free. The dinghy swung about on its course and followed meekly astern of us, all interest in the unequal combat forgotten. In another minute the hand line fouled Bert's, and we hauled it aboard to get it out of the way of that seventy-five-pounder.

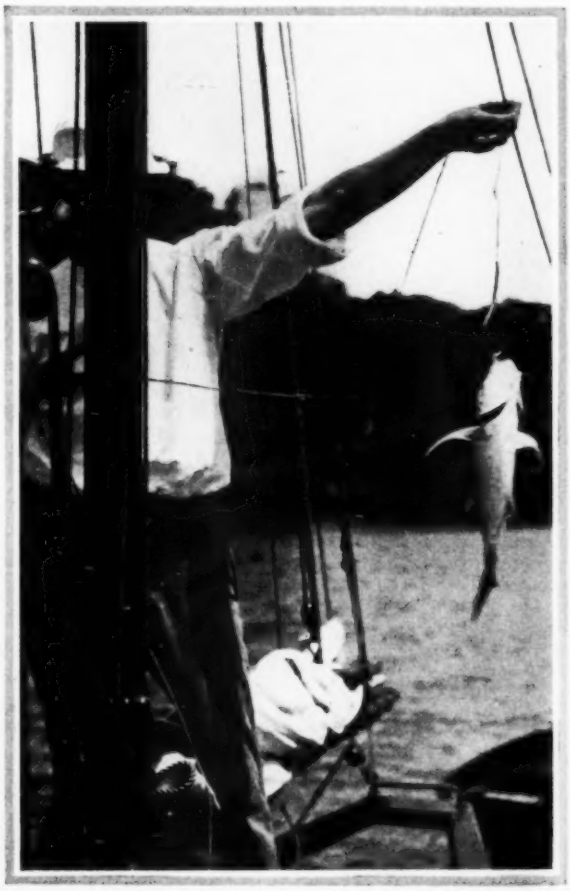
"Two lines is enough," said someone, "and we'll get a fish soon. That strike of Bert's wasn't any optical delusion."

Words came to my lips, but hung unuttered as Ben's pole whipped down to water.

"A seventy-five-pounder?" I cried, forgetting my intended mention of the dinghy.

"Shucks, no," said Ben. "It's only a jack. Still, I may as well bring him aboard."

(*Continued on page 74*)



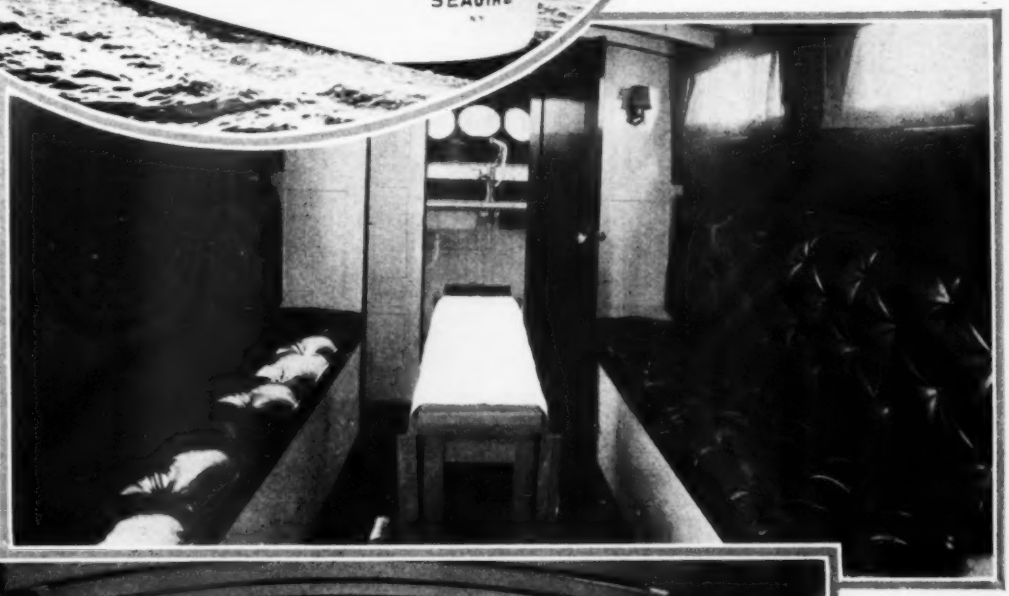
The prize trophy of our expedition—a five-pound jack

Sea Girl, a Notable Cruiser

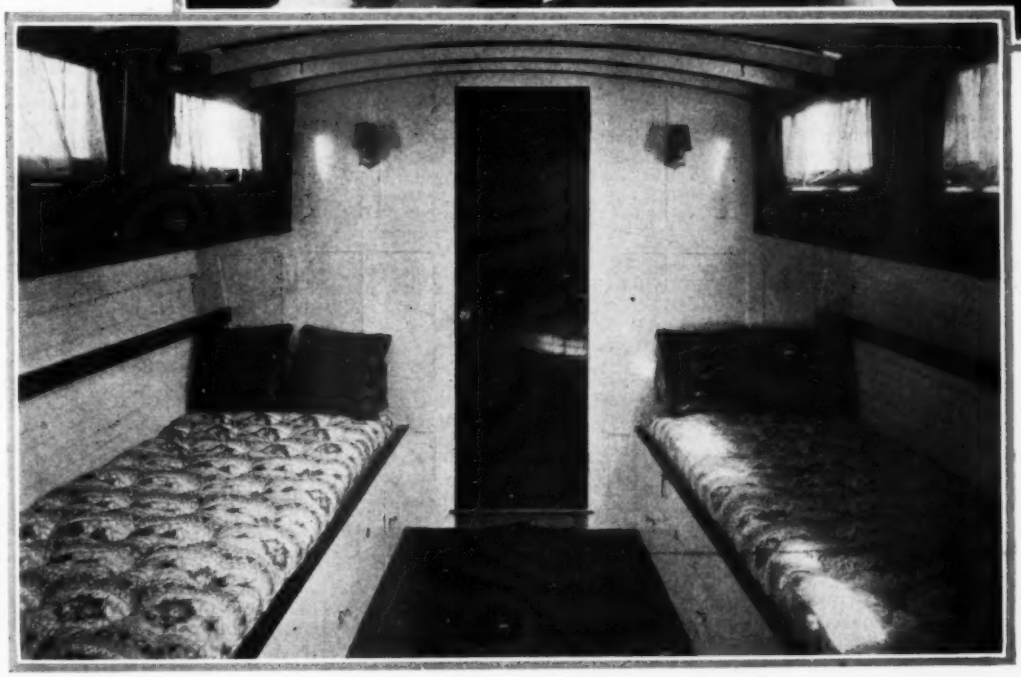
The Addition of a New Scripps Power Plant Made a Decided Improvement in the Running of the Boat

Photographs by M. Rosenfeld

Sea Girl, of the fleet of the Bayside Yacht Club is 50-feet long by 10½-feet beam. She was designed and built by G. T. Steltz of College Point, New York for B. Kleinschmidt

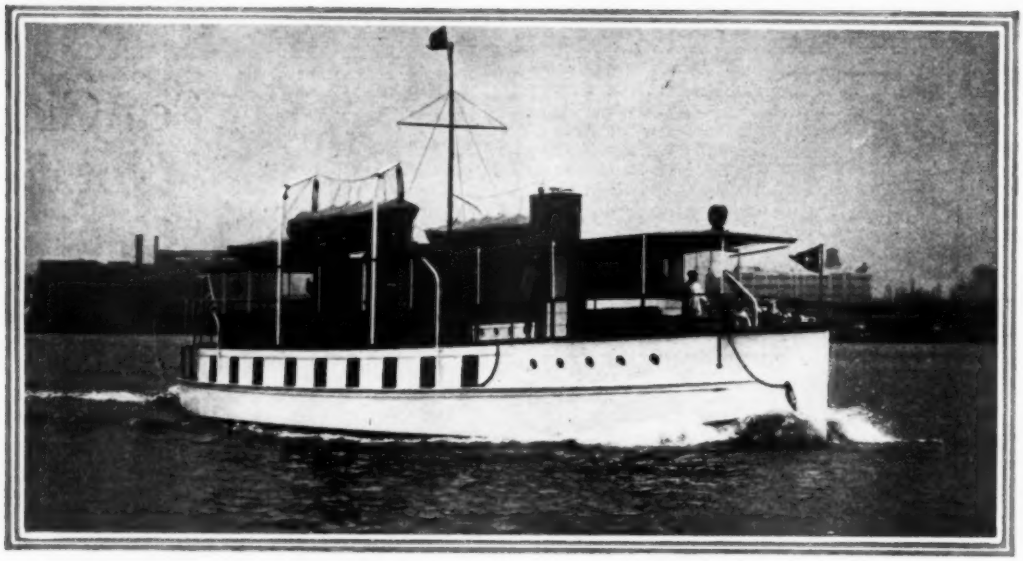


Forward portion of the main cabin of Sea Girl, just aft of the engine room bulkhead and the combined galley and pantry, is devoted to the dining saloon



After portion of the main cabin space showing the large, comfortable berths. No vibration is experienced here as the newmodel E 6 Scripps motor of 4½ by 6-inch bore and stroke runs particularly quietly. It turns a 22 by 18-inch propeller at 1,200 revolutions and gives a boat speed of 15 m.p.h.

Photograph by J. N. Pearce



Pilgrim, a new 87-foot houseboat cruiser completed by the Mathis Yacht Building Co. for W. M. Elkins of Philadelphia and Islesboro, Maine.

The Building of Modern Yachts

Increased Boating Activity Evidenced by the Completion of Many New Craft at the Camden Yards of the Mathis Shipbuilding Company

UNUSUAL activity has been evident this summer in the big yards of the Mathis Shipbuilding Company at Coopers Point, Camden, N. J. Many different types of new craft have been built and completed there this season in a wide assortment. There have been fast express cruisers, seagoing auxiliary sailing craft, and the regulation type of houseboat in several different sizes. Little has been said about the tremendous amount of work being turned out here for prominent yachtsmen in all parts of the country. The high quality and standards of workmanship required by the designers of these craft have been faithfully carried out by these builders. Prominent among the new vessels is the fast express cruiser Lazy Lady, which was built in the yard from a design by Thomas D. Bowes, the Philadelphia Naval Architect, for Robert Wolstenholme. Others are the auxiliary sloop Nedmac, which was designed by John Trumpy, the Naval Architect of the Mathis Company, and built under his direct supervision. This boat is 55 feet 6 inches long but only 39 feet on the water line. Her draft has been kept to a minimum and she can navigate on 3 feet of water when necessary. Due to her unusual design, she has comfortable cruising accommodations for four and when required can spread sufficient sail area to make sailing interesting and permit the boat to be handled easily by one paid hand.

Prominent among the houseboats which have been turned out this season are Snug, a little one of only 63 feet, built for Arthur Bloch of Philadelphia. A 75-footer called Amitie was also completed for Charles Prettyman of Philadelphia. Another, larger still, is the 87-foot houseboat Pilgrim. This was completed for Wm. M. Elkins not long ago and is now in service at his summer home in Maine.

The houseboat Snug, the smallest of the several built at the yard this summer, was designed with the idea of improving on the 61-foot single screw houseboats which were built earlier. At the same time, more deck space and increased accommodation were desired. This was accomplished by increasing the length two feet and the beam slightly. A twin screw power plant was installed and two 32-37 h.p. Standard engines give her a speed of 11 miles. Her model, together with the twin screw installation, make her an ideal boat for outside use as well as the shallow draft for inland service.

A houseboat of somewhat larger size is Amitie, which was made 75 feet long and powered with two 70 h.p. Speedway engines, which give her a speed of 12 m.p.h. Her accommodations below are, a double owner's stateroom aft, two bathrooms, two single staterooms and one dining saloon. From the dining saloon a stairway leads to the deckhouse and from the landing of the stairway a vestibule connects with the living room in the forward part of the deckhouse and the owner's stateroom on the port side aft in the deckhouse.

Pilgrim, one of the largest houseboats built by the Mathis Company this season, is 87 feet in length. Her owner, William M. Elkins, is using her at his summer home in Isleboro, Maine, to which place the boat went directly from the builders yards. There are two 80 h.p. Winton gasoline engines installed in her, which give her 12 miles speed. The boat is similar in a great many ways to the houseboat Luneta, owned by Colonel Slocum of Washington. The owner's quarters aft have three double staterooms one single stateroom with Pullman berth over and two complete bathrooms. A complete electric light plant is carried consisting of a Winton generating set with Edison storage batteries. An automatic pressure fresh water system is provided as well as an electric windlass, which is also used as a boat hoist.

The auxiliary sloop Nedmac is a most comfortable all-around, common-sense auxiliary cruiser. She has been designed to provide a good sailor with ample cruising accommodations. The design developed to meet these requirements provides a modern type of centerboard boat with combination trunk and cabin and raised deck, good beam, and freeboard, moderate overhangings and ends sharp enough to prevent pounding in rough water and still reserve buoyancy enough to keep her from taking solid water on deck. She has proven a splendid sea boat notwithstanding her shallow draft, is perfectly balanced and easy to handle under power as well as under sail, proving to be very fast even in a light breeze.

Lazy Lady is a modern type of express cruiser which is fast and at the same time a real cruising vessel and not only an afternoon or day boat. She was built for Robert Wolstenholme from designs by Thomas Bowes and is intended to be a 30-mile craft. A pair of 300 h.p. Murray & Tregurtha motors are installed to supply the necessary energy. Columbian propellers of 26 inches diameter and 26 inches pitch, turning at 1,600 r.p.m., convert this power into speed. A Universal generating set of 2 k.w. capacity connected to a set of Edison storage batteries is used to supply ample current for all requirements. Fuel is carried in 500-gallon tanks between water-tight bulkheads forward of the engine room.

Thorough trials of Lazy Lady in all kinds of weather have proven her to be a remarkable sea boat in every way. The shape of the hull is such that it is practically impossible to get any solid water aboard of her forward. When performing in a heavy beam sea her behavior is quite remarkable as she rolls very little. In working out the design it was required to produce a boat that could be driven at high speeds in shallow water, as the owner's summer home is located on Barnegat Bay. The boat has been driven at 24 m.p.h. in 8 feet of water without dragging a sea.

Snug, a Twin Screw Houseboat

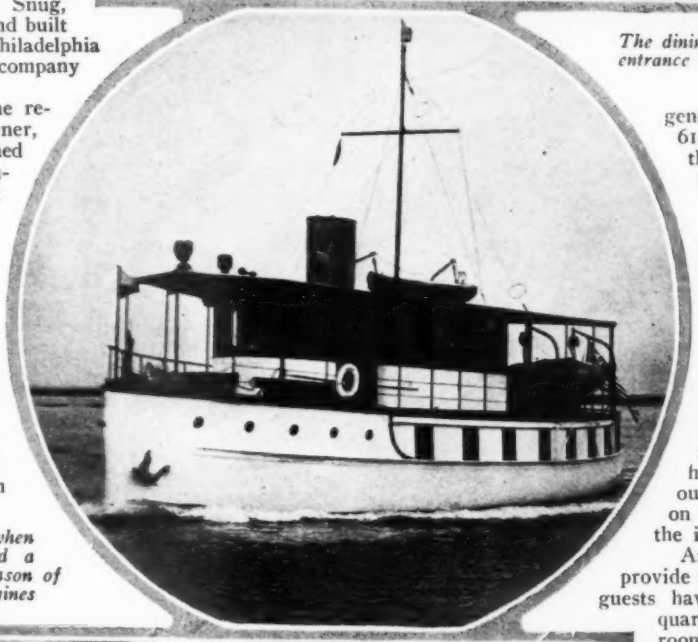
A Small Boat of Improved Type With Increased Accommodation and Comforts

Photographs by Bond Bros.

The dining saloon amidships with the entrance to the galley on the right

PROMINENT among the several boats of varying type which have been completed by the Mathis Yacht Building Company at their plant at Cooper's Point, Camden, New Jersey, this summer may be mentioned the 63-foot houseboat Snug, which was designed and built for Arthur Bloch of Philadelphia and delivered by this company not long ago.

In order to meet the requirement of the owner, the boat was designed with the idea of improving on the 61-foot boats which this company had been building previously. These were of the single-screw type, and it was felt that more power was desirable, and at the same time greater accommodations and increased space in the deck-house was wanted. This was accomplished by making the model in general quite similar to the 61-foot stock houseboat with the exception of increasing the length by 2 feet and increasing the beam slightly by a matter of 6 inches. The power plant which was installed consists of two Standard marine gasoline motors of the 32-37 h.p. type. These give her a speed of 11 miles an hour without difficulty. The model of the boat, together with the twin-screw installation, makes her an ideal craft for use out on the ocean as well as on the shallower waters of the inland rivers and bays.



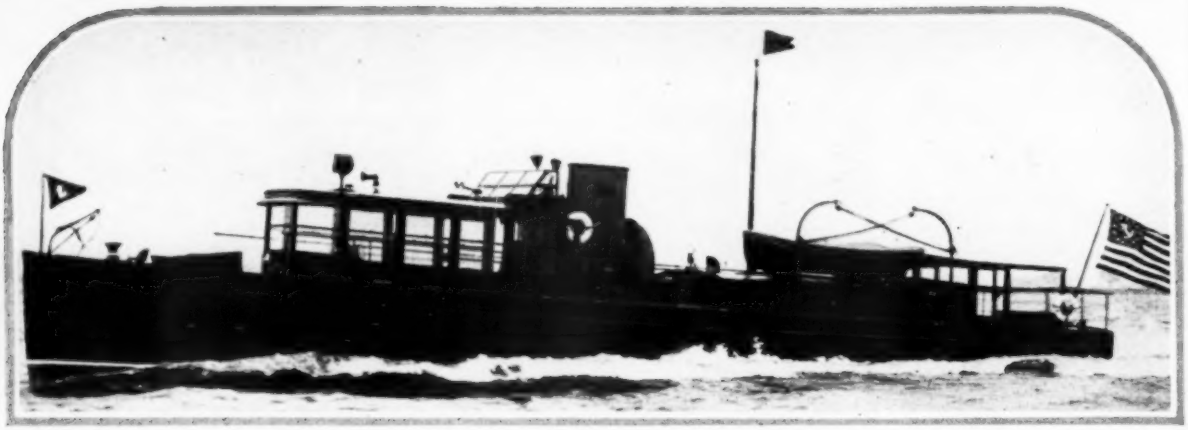
The houseboat Snug when underway has developed a speed of 11 m.p.h. by reason of her two Standard engines

Ample accommodations to provide for any possible number of guests have been provided in the quarters aft. One double stateroom on the starboard side and a single stateroom on the port side, both of which are furnished as guests' rooms. There is, in addition, a complete bathroom and also an individual toilet room.

Amidships there is a large dining saloon which connects with the galley on the starboard side, and by carrying the windows in the side of the hull further forward than was the case on the original 61-foot boats, it is possible to provide two windows in the galley and one in the engine room which assists materially in the problem of light and ventilation.

The spacious after deck immediately astern of the deck house is an attractive lounging place

Photographs by M. Rosenfeld

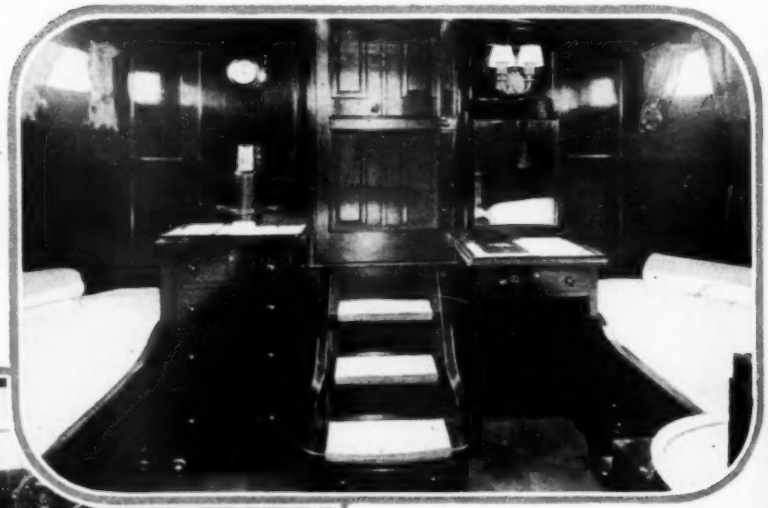


Lazy Lady was built for R. Wostenholme, of Philadelphia, by the Mathis Yacht Building Co., of Camden, N. J., from designs and under the supervision of Thomas D. Bowes. Her dimensions are 67 feet in length, 13 feet 6 inches beam and a draft of 3 feet 8 inches

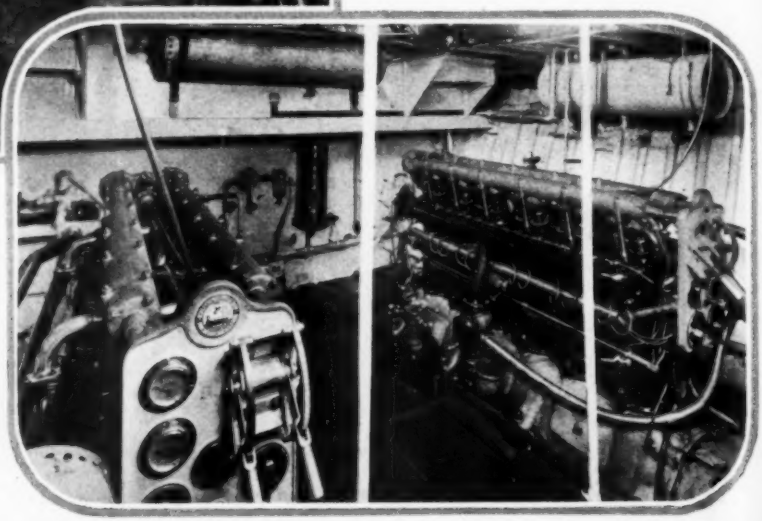
Lazy Lady

Latest Type of Fast Cruiser Combines in One Craft the Qualities of Speed, Comfort and Appearance

The accommodations are extremely roomy for a boat of this size. Her owner's quarters aft consist of two large double staterooms with wardrobes, bureaus, and dressing tables and a bath room located between them. It is possible with this arrangement to go on deck from either stateroom or bathroom without going through any of the other compartments



The deck house forward is also used as a dining saloon. It is as large as would be found on many cruising boats of larger size. An extra steering station and engine telegraphs are provided in the deck house for handling the boat in inclement weather

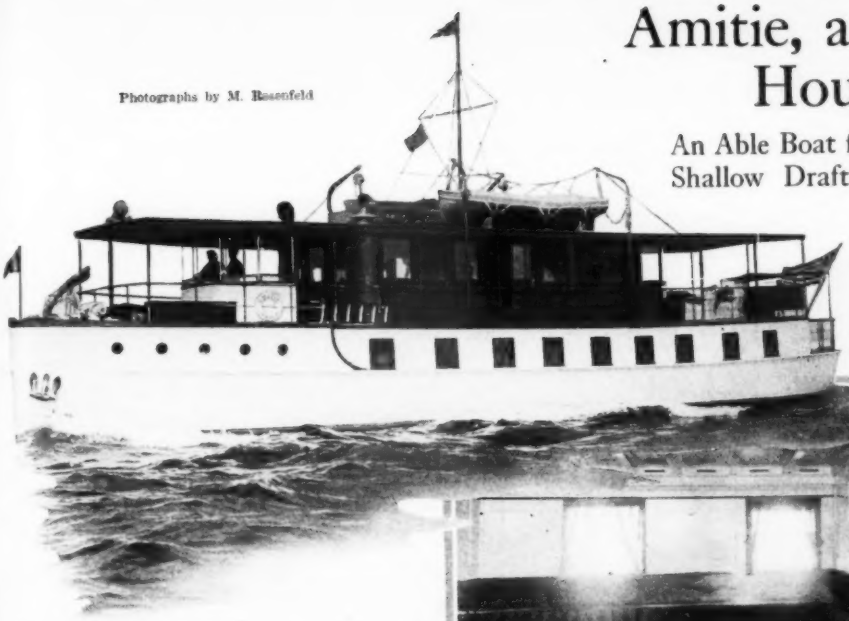


The engine room equipment consists of two 300 h.p. Murray & Tregurtha high speed motors. On a displacement of 60,000 pounds they will drive the boat at 30 m.p.h. through 26 by 26-inch propellers. Auxiliary lighting equipment consists of a 2 k.w. Universal set with Edison storage batteries. A double filtering system is used on the gasoline lines to insure clean fuel

Amitie, a Wonderful Houseboat

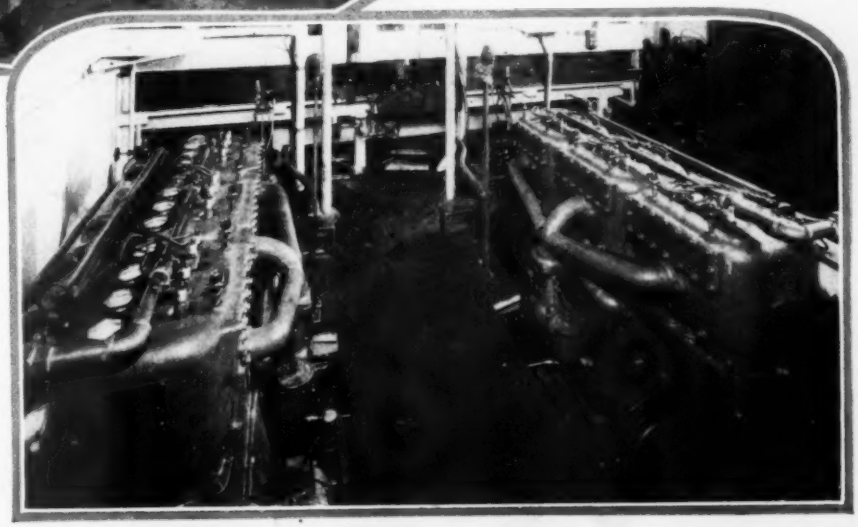
An Able Boat for Outside Going with Shallow Draft for Inland Cruising

Photographs by M. Rosenfeld



The new 75-foot houseboat Amitie, just completed for Charles Prettyman of Philadelphia by the Mathis Yacht Building Co. of Camden, N. J., is similar to the larger types of houseboat built by this company. Her beam is 18-feet, with a draft of only 3¼-feet

The accommodations below are quite elaborate. The dining saloon runs thwartships of the vessel and access is had from it to the deck house and forward portion of the boat. The deck house provides for the owner's living room and stateroom, which is located on the portside aft. An enclosed steering stand is forward of the deck house all covered with a solid deck which carries the small boats



The owner of Amitie is a veteran yachtsman who has owned several boats, both steam and power driven. He has selected a pair of six cylinder 70 h.p. Speedway gasoline engines to drive the boat and they are able to maintain a cruising speed of 12 m.p.h. Auxiliary electric machinery is carried for lighting purposes

Southward With the Birds

A Tale of Wanderings at Sea and Adventures Which May Befall the Cruiser on a Voyage to the Lands of Sunshine

By Aland C. Rover

The ship in the boat basin at Interstate Park on the Hudson before starting South

WHEN I look back to our last cruise down the coast, I see nothing, at first, but a great blank with two bright spots. I am reminded of the gray storm rack sometimes covering the western sky and a slender lighthouse rising out of it like a white ghost. I am reminded also of the curious sight offered so often by the approaching Florida coast, when everything—heavens, land, water—disappears in a pearly, shiny uniformity of horizon, and only a few palmettoes that look like feather dusters are left to float in the air.

Two bright spots, I said. It may require some conscious effort to bring back to mind many of the emotions of the trip or to recall many of the details—momentous details, some,—of its daily progress; but I have no difficulty whatever in remembering—first, how we gradually worked ourselves into it; second, what persistent demands it made upon the ship's treasury. In other words, no matter how many more valuable experiences may lie between these two ends, it is very plain to me how we got into it, and how we got out of it.

They have a saying, down in Florida, that whoever gets any Florida sand into his shoes, will go there again; inasmuch as it is impossible to walk on Florida soil without getting a liberal supply of sand into one's shoes, anyone who has once been there is bound, sooner or later, to return. The Floridians are more practical than the North Carolinians in this respect. We were told in some parts of the Old North State that he who drinks of its waters is fascinated by the lure of the state for the rest of his natural life. It is entirely feasible, however, to go through North Carolina without drinking any water at all; the bond built on water, therefore, is not strong, while strong is the bond built

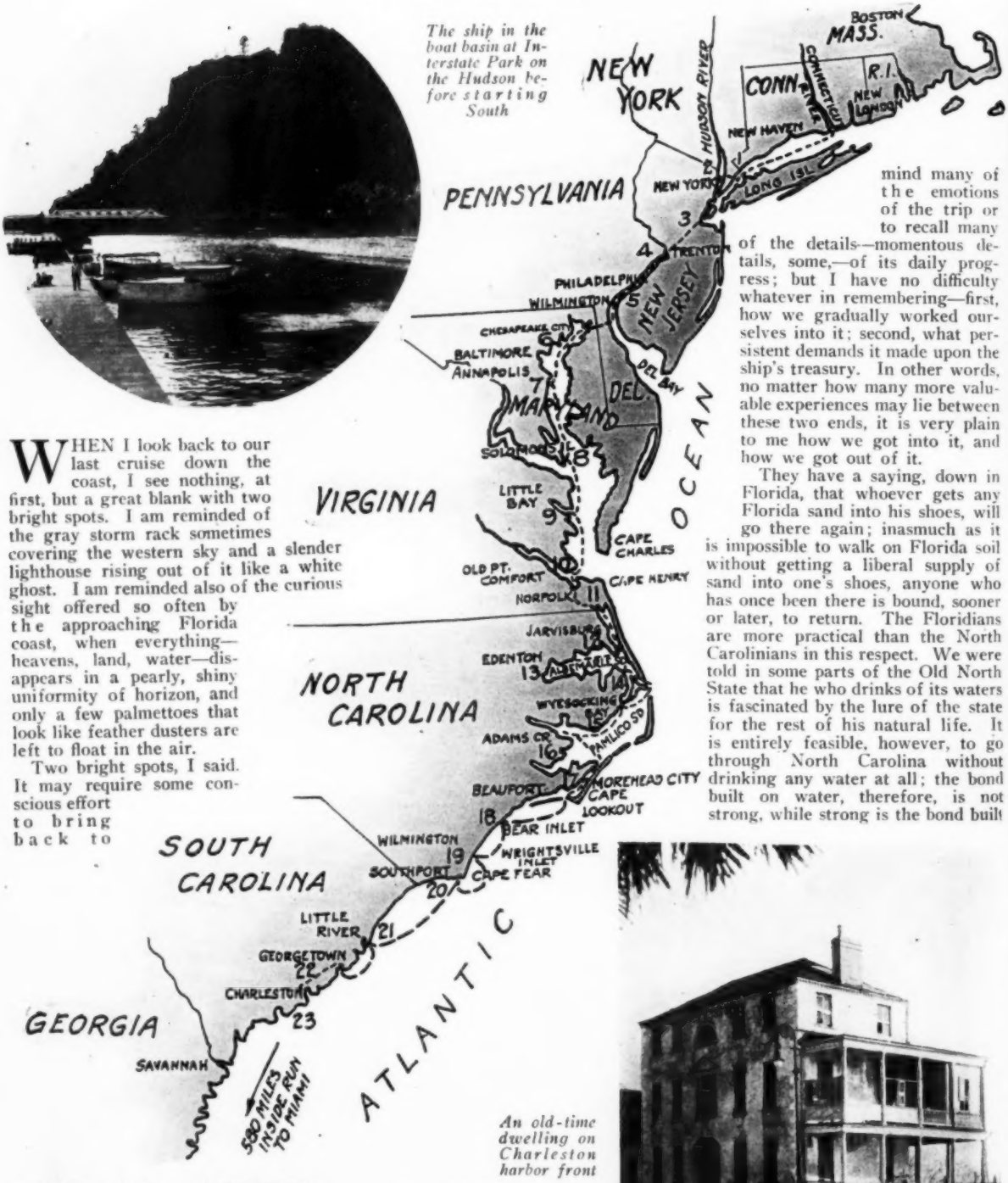


Chart of the cruise showing the day's run from place to place

INSIDE RUN ----------

OUTSIDE RUN – – – – – –

STATUTE MILES

100 50 0 100 200

An old-time dwelling on Charleston harbor front

Dick Winn, born 1820, an ex-slave who is allowed free fishing rights by the village of Edenton

on sand, whatever high and holy authorities may say about building on sand.

Many a winter had our shoes been filled by sand of Florida—sand and sandspurs. The sandspurs, in fact, seemed to be a sort of connecting link between one season of sand and the next. During the short period of a year, we never quite succeeded in ridding ourselves of all the sandspurs collected in winter and hanging desperately to our clothes, like the rice grains that insidiously nestle in the folds of a bride's gown. Such being the case, no wonder that we began to think of oranges bright and Spanish moss and alligators, as soon as the first chill began to blow upon our New England home from the northwest, our only and natural enemy.

Once the seed is planted, it will sprout. The thought grew into desire, as we saw the swallows gather in huge flocks and depart. The desire grew into plans, when we saw the ducks take to their wings, and the blackbirds fly after them. When, finally, the geese began to muster into their remotely Macedonian phalanges and to honk through the heavens, the plans matured into action. We could stand it no longer. The boat was there, tied to a post below the bank and swinging with the tides of our cherished Connecticut. "Why put it in cold storage?" thought we. "Has the poor thing been so faithless to us that we should leave it to the stern punishment of a New England winter in a boat yard?" So, on board we jumped and we were off—off with the geese.

Many times during the trip, as we heard the familiar honk of a passing flock, with our fog horn we honked back in recognition. I felt as if a kind of spirit communion had been established between us and all the geese of the universe, and every honk from the sky was a friendly greeting from a fellow traveller, albeit a trifle swifter. Maybe I was wrong. Perhaps the honk was only the shout of him, who could get out of sight of a plodding motor-boat in less time than it takes to say it—and he, only a goose and two wings! Or perhaps it was a loud song of satisfaction in life; or perhaps it meant nothing at all. However, no goose ever came to tell us what it did mean, and we could stand by our own interpretation, for all the pleasure we derived from it. Thus, we got into the trip.

As for getting out of it, that was mainly a matter of drafts on the ship's treasury, I said. Much happened during the voyage, of course, and the draft of the ship occasionally forced itself upon our attention as peremptorily as the drafts of the ship's treasury; but the one prominent, outstanding and ever-recurring action was the almost daily call at the gasoline station. The ship found its way to that as surely and faithfully as the old horse on the farm used to find his way to the manger, the moment he was free to choose for himself, or the dog to his bowl of soup, or the cat to his saucer of milk. I have never seen, nobody has ever seen, anything so voracious as a gasoline engine that works in a boat. Boat owners are, of course, aware of the doleful fact that it takes a lot of juice to produce that enchanting effect—a snow-white craft, gliding over the water like a swan—but few, even among them, realize what that really means, unless they start on a real grind, lasting, day out, for weeks and for months, and running miles into the thousands. Often have I thought of an old story, as I sat by the mouth of the gasoline tank and watched the supply of bright liquid pour in a steady stream, diffusing all around a fragrance of ethereal perfume, sometimes, and sometimes

Back waters of the Connecticut river, the home port

A very old cypress up creek at the end of Albemarle Sound, where the still waters run deep

a less acceptable odor, the story of a little boy, who, having gorged on pie and cake and nuts and candy and other ingredients of a Thanksgiving dinner, and having risen to clamor for more, to the objection of an anxious mother, calmly remonstrated: "But, mother, I'm not stuffed yet!" And, to be sure, one cannot disregard the insatiable appetites of a marine motor, no matter how unreasonable they may seem. Only once did I try, having very unlovingly reflected that the motor ought to be able to go a certain distance on what there was in the pantry—I mean, the tank—and I was left out in the cold to swing from an anchor with a doubtful grip, in the racing current of a South Carolina inlet. Whereupon, I determined that never again would I attempt to discipline a motor; but that all its wishes and caprices and freaks would be most unquestioningly humored and most promptly yielded to. Unsound pedagogics, perhaps, but safe. And this is how we got out of it.

Of course, it takes more than the head and the tail to make a living body, and our trip, like all living bodies, has many parts between those two extremities, parts of most vital importance, of more vital importance, at least, than the tail end. Only it is easier to notice the tail than the heart, because the tail waggles briskly in the air and the heart beats softly within the chest. That is why I mentioned the extremities first; the vital organs come next for consideration.

To begin from the beginning, let me first introduce the *dramatis personæ*:—the ship, the crew.

The ship. A puny craft, the ship; somewhat under thirty feet in length and about eight feet wide; a cabin cruiser, provided with a stout frame, a high and flaring bow for dry traveling, a canopy over the cockpit for protection against inclement weather, comfortable bunks to sleep in, and a well stocked galley. On a long cruise, bodily comforts must be looked after with much care, as from them spring the cheer and the courage and the final success. Our ship had a doughty motor and sound, that could plug along all day and never mind the effort, if it were left to its own slow and steady pace, like the classical ox. It follows, that the speed of our ship was small, and even that we reduced a mile by stowing away, in the dark hold of the bilge, seven huge pigs of iron ballast. We thought the ballast would correct the ship's bad habit of rolling heavily at the least provocation, like a bow-legged man. In practice, as we discovered on a later occasion, those pigs rendered us a much greater and greatly appreciated service, besides that of steadying our step.

We thus traveled at a gait of about seven miles an hour—not very majestic, but sufficient for our purpose, which was that of wandering along the sea coast, more than of reaching any definite goal. Very naturally, all the craft that came along overtook us without difficulty, like the geese overhead. But we never begrudged any of our fellow yachtsmen the joy he certainly felt in showing us his heels. We had, for one thing, the pleasure of seeing whence he hailed. Boats generally have the name of their home ports writ big upon their sterns. We had, for another thing, the pleasure of being let alone all of the way. As no motorist on water will ever slacken his rate if he can help it, we were spared that annoyance of self-appointed company, which often arises from no better reason than an approximately equal speed. Finally, we had more than one opportunity to prove that, on water as well as on land, the tortoise can beat the hare, and in a less tricky fashion than the fable ascribes to him.

The crew. As the matter of the crew personally concerns the writer, it may not be dwelt upon here to any extent, and especially not in what touches its quality. Let the praise be with the ship and all her smart working, whenever praise is to be bestowed. The crew will be allowed any

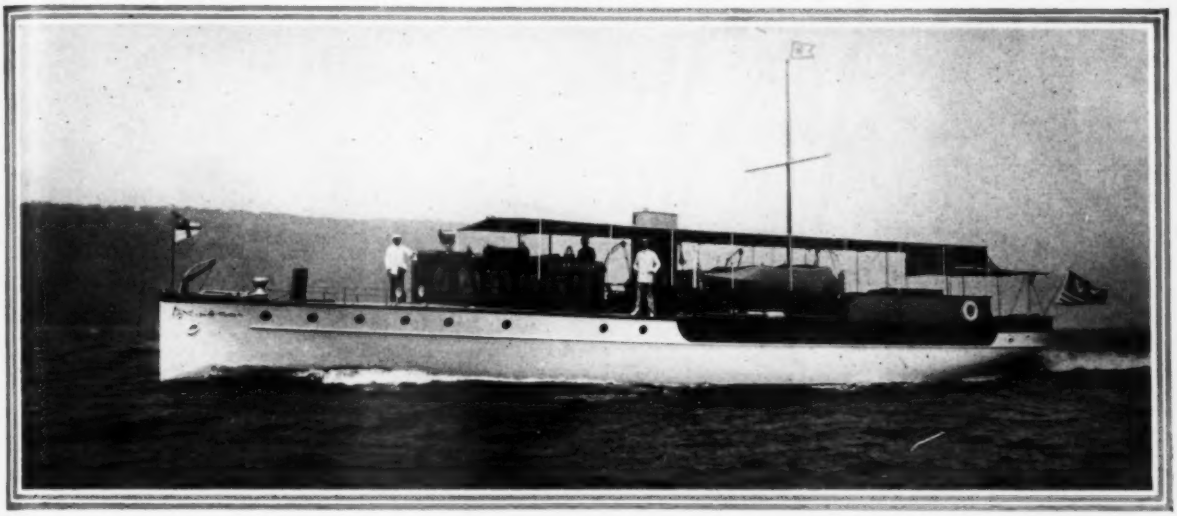
(*Continued on page* 68)

The home port on the Connecticut from which the ship set out

Service Record of Eight-Cylinder Motors

Conclusive Proof of Satisfactory Performance of Multi-Cylinder Engines in Cruising Boats is Given by the Installation in Elbaroda

Photographs by M. Rosenfeld



THE installation of eight-cylinder high-speed engines in a cruising boat has been a subject of long discussion among marine architects and engineers. However, from time to time, there appears proof positive of the satisfactory performance of the eight-cylinder type engine in the larger and heavier boats. Such examples are, no doubt, troublesome to those who claim there is no place for the high-speed eights in boats of the cruiser type, nevertheless such evidence cannot and should not be withheld.

An eight-cylinder engine, where the cylinders are in a row, does not seem to be as popular as the six-cylinder type. The reason for this, apparently, has been largely due to vibrations arising from imperfect installations in cases where the engine is not adapted to the design of the boat, and where installation is improperly made.

The best example that appears at this time is the yacht Elbaroda, an 86-foot cruiser, designed and built in 1919 by the Consolidated Shipbuilding Corporation, Morris Heights, N. Y. City, for A. C. Woodman, Philadelphia, Pa. Two eight-cylinder high-speed engines were installed when she was built. For two years the yacht has been in continuous use and travelled better than 25,000 miles in that time.

That there are still many followers of the good old-fashioned sport of sailing is demonstrated by the fleet present at the start of the recent cruise of the Larchmont Yacht Club to join the fleet of the New York Yacht Club on its annual cruise to the east on Long Island Sound

Hand Proves That He Can Design Sail as Well as Motor Craft That Can Win

Black Hawk, a New Sixty-Two Foot Auxiliary Schooner, Makes Clean Sweep of Schooner Class at Race Meet of New Bedford Yacht Club

Black Hawk, the new auxiliary schooner designed by William H. Hand, Jr., and powered with a type G. H. Sterling motor, which defeated all comers recently at New Bedford

IT has been said that Billie Hand can design a pretty fine motor craft, either of the fast or slow type, but that when it comes to out-and-out sail boats or auxiliaries that he was going out of his field.

It is a fact that no one has designed more successful motor craft than Wm. H. Hand, Jr. He is known the world over as the father of the V-bottom motor boat. Many designers, both amateur and professional, have tried to copy, and in some cases improve upon, Mr. Hand's V-bottom designs, but in the last analysis none of the designs have been any improvement, and in many cases not as good as the original.

The design of the underbody for a successful sailing craft is a no more difficult task than designing a successful motor boat. In fact, there have been more failures at the latter than with the former. Many designers have not yet learned that it is impossible to put a 40-mile-an-hour underbody on a 6-knot boat. The opposite of this is equally true.

Mr. Hand, after he had sold his famous auxiliary schooner Whistler last year, set to work designing a new boat which would be somewhat similar in size and rig to Whistler but an improvement upon her, if such a thing were possible. The design he produced, recently built by Hodgdon Brothers of Maine, shows that he was successful in turning out a craft which is absolutely the last word in motor boat design and construction.

Black Hawk, as the designer has called his new ship, was not designed or built with any intention of racing. The main object was a boat constructed as heavily and strongly as possible and suitable to go anywhere, at any time, irrespective of weather or sea conditions. However, when the New Bedford Yacht Club, which is Mr. Hand's home club, announced its decision to try to revive racing in that locality by holding a race week in August and announced that it would have a class for auxiliary cruisers, the owner decided that in order to make the race meet more successful he would enter his Black Hawk, not believing for a minute that his boat, which in reality was big enough and heavy enough to carry on board any of the other contesting schooners and carried no light sails whatsoever, would have any chance to win, especially in the light airs which are usually found in August on Buzzard's Bay.

Seven auxiliary schooners were entered. In overall length they were all approximately of the same size, namely about 60 feet. The race consisted of three heats of approximately 25 miles each. The courses were laid out so that the boats had competition on all points of sailing, to windward, leeward, and reaching. Schooners from the boards of the best designers of the country and from the yards of the best builders were entered, and none of them proved a match for Black Hawk. She won in straight heats by a margin which left no doubt in the minds of anyone as to her superiority, even over the light racing craft which she raced against.

Black Hawk is powered with a four-cylinder type G.H. Sterling motor of the heavy duty type with a bore of 5¾ inches and stroke of 6¾ inches. She is 63 feet 3 inches in length by 16 feet beam and 8 feet 6 inches draft.

Boats, Powerful and Fast

The Installation of Modern High Speed Engines Rejuvenates Many Craft and Gives Them a New Lease of Life

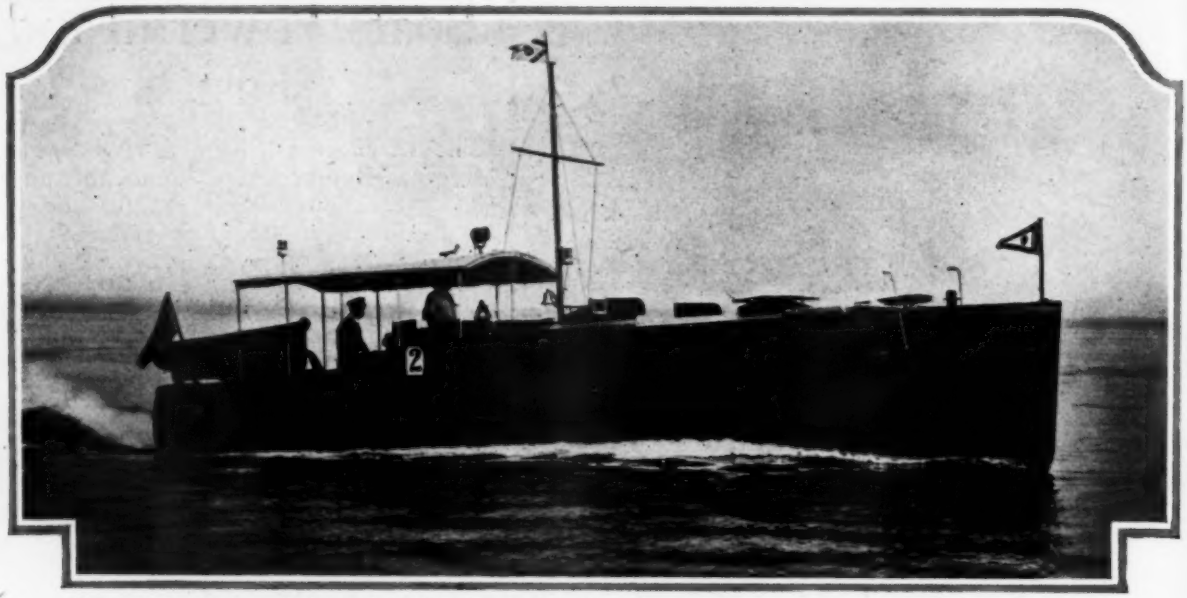
Ballaho, a smart 30-foot Hacker design runabout owned by Robert Wood Johnson, New Brunswick, N. J., is in daily service on the Shrewsbury River. Her 200-h.p. Hall-Scott engine drives her at close to 40 miles

Viva, a 40-foot Hand design cruiser which is operating on Lake Tahoe in the Sierra Nevada Mountains. A 200-h.p. Hall-Scott motor installed in this boat showed a speed of 25 miles on trial trips

Sylvan, another Hall-Scott powered craft used by R. E. Wilbur at Alexandria Bay is a typical Thousand Islands runabout. The four-cylinder Hall-Scott motor drives her unusually well when her 36-feet of length is taken into consideration

Restless, another Thousand Islands boat which is 35 feet in length. Her owner, W. H. Downey of New York, uses her continuously during the summer on Alexandria Bay. She is an attractive round bottom boat of the early type modernized with a four-cylinder 125-h.p. Hall-Scott motor which drives her close to 29 miles

Photographs by M. Rosenfeld



Diana, the fast cruiser of Commodore A. B. Cartledge, which takes the Cruiser Championship Trophy to the Delaware

Diana, the New Cruiser Champion

Famous Trophy Emblematic of the Cruiser Championship Goes to the Delaware River on the Third Attempt to Lift It Out of New York Waters

By F. W. Horenburger

AMID the usual last-minute excitement, the race for the American Power-Boat Association Handicap Cruiser Championship of America was started promptly on time on August 5, 1922. An express cruiser class had been added this year, but only two competitors appeared to take part in this class. These boats were Harpoon and Adriel Too, belonging to Comm. M. S. Cornell, Jr., and L. M. Brooks, of the Middletown Yacht Club. These boats are exactly alike in dimension and power equipment. They were started on their journey of 117 miles, one-half hour prior to the class for slower cruisers. Due to differences in the trim of the two boats, the ratings under American Power-Boat Association rules were not alike, and a time allowance was granted to Harpoon to offset this difference. As it happened, the boats were not called upon to exert themselves, and the actual finish occurred within a few seconds' difference. Adriel Too, being the faster of

(*Continued on page* 92)

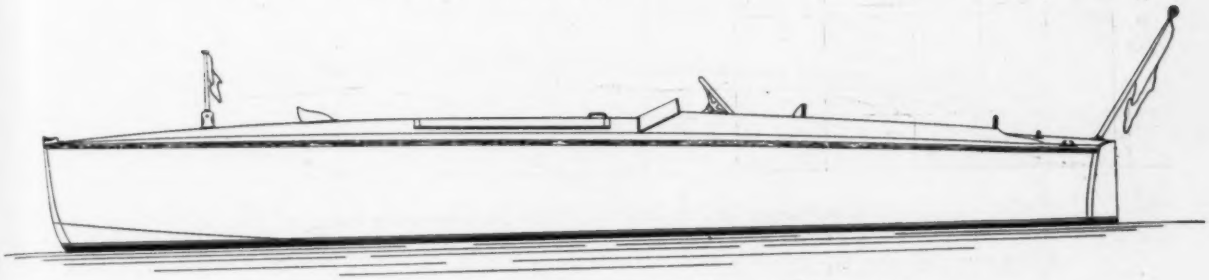
Harpoon, Commodore M. S. Cornell, Jr.'s fast express cruiser, which won the trophy in its class

Fleetfoot, a Fast Runabout

A Complete Design and Specifications to Enable Anyone to Build a Fine Boat

Designed Exclusively for MoToR BoatinG

By John L. Hacker



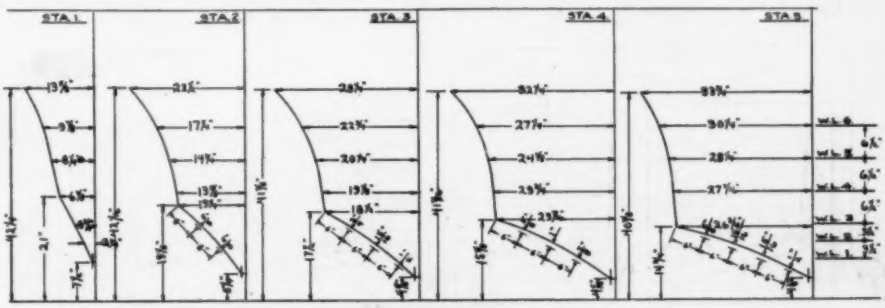
Outboard profile of Fleetfoot, a 22-foot runabout designed by John L. Hacker

IN general the building of a small motor boat is a much bigger proposition than appears at first glance. No amateur boat builder should plunge blindly into the construction of a boat unless he is sure that the necessary store of time and patience is at hand so that the work may be properly completed. It requires skill and craftsmanship of no mean order to turn out a creditable job. The mere reading of a set of instructions, or a story on how to build a boat is not sufficient to impart the necessary skill. It is wise to select the simplest type of boat for a beginning and after sufficient experience has been acquired the time for building a more pretentious craft may be considered to be at hand. Generally the V-bottom type of boat is not the simplest to construct. Professional builders prefer the more conventional round bottom type as offering less difficulties in the shop. The V-bottom type, however, has so many advantages to offset the slightly increased amount of work necessary to produce it that these are not permitted to weigh against it. The construction of the bottom of the hull follows the modern seam batten method, and this has many points in its favor. It is possible to fasten the planking securely and eliminate the possibilities of leakage along the seams. The strength of the hull is also improved by this method of construction.

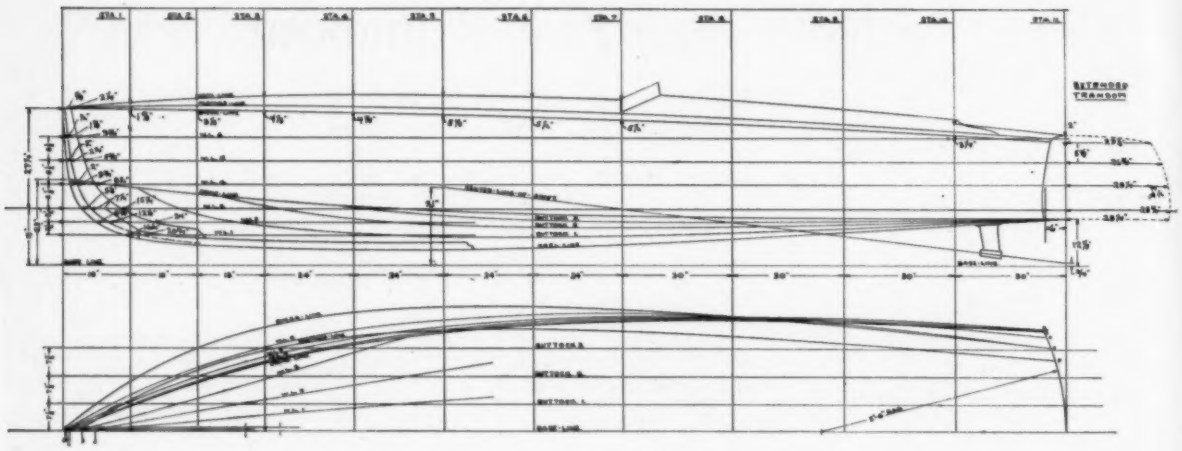
The designer has specified a Kermath motor of 20 h.p. for this boat. It is, of course, possible to install a larger motor, but in no event should the motor weight exceed 650 pounds. If greater weight is installed the boat will not trim properly and the designer's calculations will be upset. The recommended motor is certain to give wonderful service in the boat and only where greater speeds up to 27 to 30 m.p.h. are wanted should more power be fitted. In the event that a larger motor than specified is provided it will be advisable to install a steam bent frame between each station frame. This should be ½ by 1 inch and continuous from keel to the deck and tied across the keel with a small floor. The space in between the battens should be filled out with pine fillers and a radius piece fitted at the chine. This is only necessary where greater power is used, as the Kermath motor recommended will not require this reinforcement. The designer has built numerous boats along the general lines of this one and anyone for whom this size is sufficient will find it a most satisfactory outfit.

In constructing a boat of this type the conventional methods are followed. A level floor is selected and on it the keel assembly is erected as called for by the drawings and blocked up at such heights as they require. The stem and transom are attached and bolted as required, after which the mold sections are erected and stayed into place at each of the several stations. The battens and chine pieces can then be laid on and secured, and when these have all been properly faired the hull will be ready for the planking, which is attached as provided in the specifications. The completion of the hull by the addition of the decking, hatch coamings, seats and other miscellaneous fittings then follows and requires only a sufficient period of time for their installation. The motor may be dropped into place before the hull is finally completed and the balance of the work done with it in place.

Many of the fittings which are specified for this hull are in production and can be supplied to those who desire to build a boat. The Editor of MoToR BoatinG will be very glad to furnish this information to any who request it. Readers who may desire additional information on any point which may not be clear to them should also write to the Editor and have their doubts cleared up. The complete specifications which follow will also provide instruction in the method of building and the order in which the various steps should be undertaken.



Mold sections for the forward stations



Complete set of lines necessary to properly build the boat

General Specifications

The principal dimensions of this little boat are 22 feet 6 inches length, 5 feet 8 inches beam, 2 feet 4 inches freeboard at the stem, 1 foot 9 inches freeboard at the stern, and a draft of 1 foot 9 inches.

Keel: This is to be of white oak or yellow pine, 1¾ by 3⅞ inches in cross section and in a single length. It is to be properly beveled and rabbeted to suit the planking.

Stem: A hackmatack knee is preferable for this member. If this is not obtainable use white oak backed by a knee of the same material. This is to be of 1⅞-inch stock, sawn to proper shape, beveled, rabbeted, and bearded to suit the planking. When completed it is to be through bolted to the keel with three ⅜-inch bolts and the rabbeting finished.

Transom: This may be either straight or curved. For the straight one use ¾-inch mahogany. It is to have cleats of ⅞-inch stock on the sides, bottom, and top. The top is to be sawn to the same radius as the deck. Fasten it to a 1¼- by 3⅞-inch stern post and mount on the keel with a 1-inch knee on each side. All to be screw fastened and the transom wood plugged. For a curve transom provide a top and bottom member sawn from 3-inch white ash to a proper radius, to finish 1 inch thick. It is to have side members of 1 inch and to be fastened to a 1¼- by 3⅞-inch stern post. The side members are to be halved into top and bottom members and also halved into the stern post. There will be two cleats on each side to reinforce the transom and a batten of 7/16- by 1½-inch to take the seam if two pieces are used. All to be screw fastened throughout. Covering boards to be of ½-inch mahogany, screw fastened and wood plugged. Mount on the keel with 1-inch knee on each side and bevel to alignment.

Frames: Frames at stations to be preferably of ⅞-inch hackmatack knees. These are to be sawn to proper shape making the depth on the bottom about 3 inches, and tapering from 3 inches to 2½ inches at the top on the sides. It is to be tied with an oak or ash floor 1 inch thick. In the vicinity of the motor this should be increased to 1¼ inches. Otherwise the frames are to consist of the side and bottom member sawn of ⅞-inch ash of the same dimensions and bolted together at the chine with ¼-inch galvanized bolts, using at least four at each joint. They are to be bolted to a floor in the same manner as hackmatack. The frames, beginning with station No. 8, are to have a continuous floor of 1 inch tapering to ⅞ inch at the chine. Frames when completed are to be through bolted to the keel with ⅜-inch galvanized bolts to station No. 7 and to have two 5/16-inch bolts through the rabbet aft to the stern. They are to be properly aligned, stayed, and trimmed in readiness for the chines and battens. All floors are to extent approximately 3 inches outside of engine stringers.

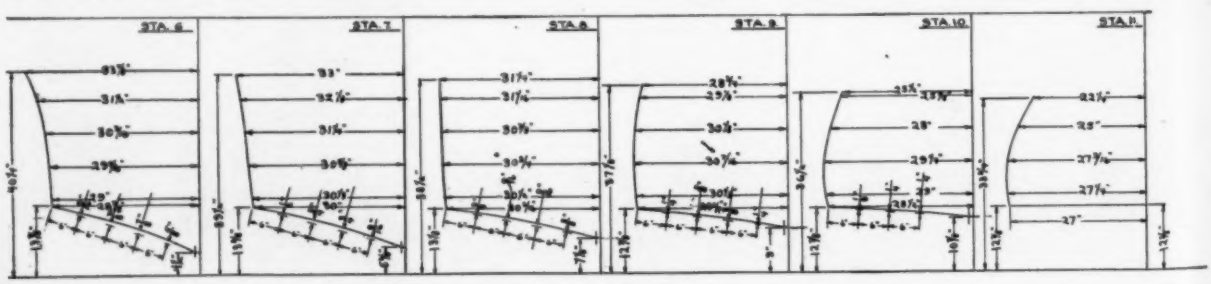
Chines: These are to be shaped from 1¾- by 1¾-inch yellow pine. A single length of clear selected stock should be used. They are to be properly beveled and rabbeted to suit the planking and to be through riveted to the station frames with 2½-inch copper nails over burrs. They are to be reinforced at the stem with a substantial breast hook and with a knee on each side at the stern. The top side of the chine may be cut out on a rip saw or joiner, making a straight cut of ⅞- by 7/16-inch depth. Then rabbet to form the bottom only. This operation will reduce the work noticeably.

Engine Stringers and Bed: These will be shaped from 1¼-inch aero spruce. They are to be let in over the floors and through bolted with ⅜-inch galvanized bolts. They are to be spaced to suit the motor to be installed so that the motor will fit properly in between. The top of the stringer in the cockpit will form the floor level. They are to have blocks on each side in the vicinity of the motor to form sway supports. The tops of these will form the floor level in the motor compartment. The engine bed is to be of 2-inch white ash properly aligned to suit the motor and through bolted to the stringer with 5/16-inch bolts. It is to be notched over the floors and drift bolted to the same with ⅜-inch stock.

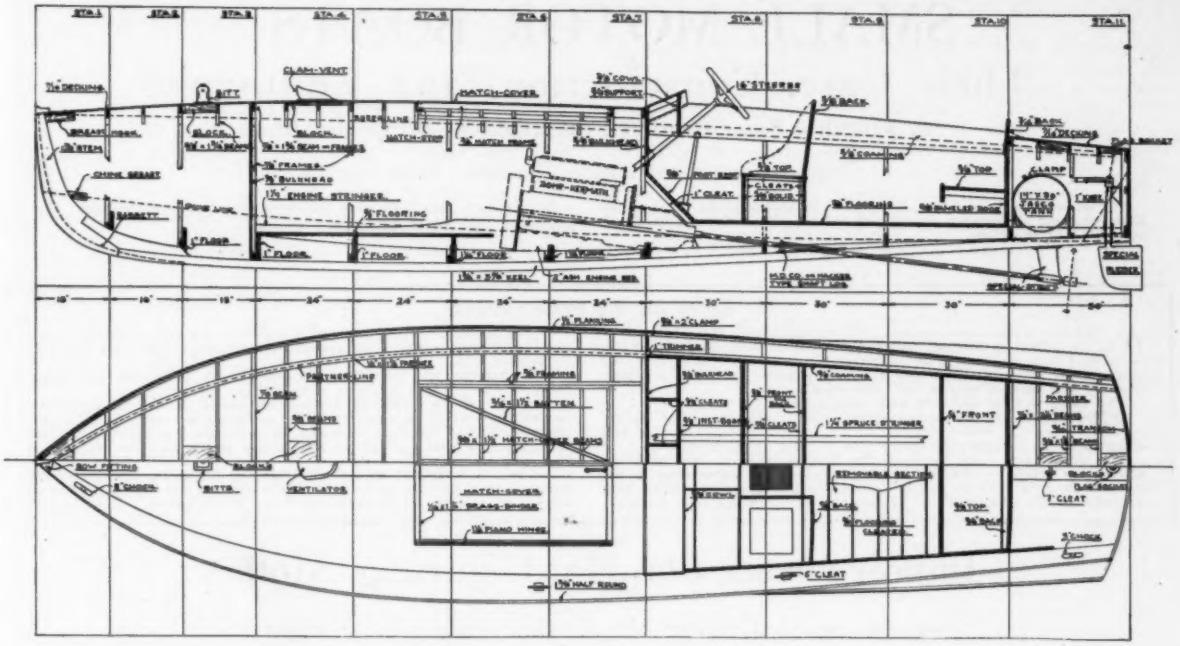
Clamps and Battens: The clamps are to be of ½- by 2½-inch yellow pine or oak. They are to be in a single length, let into the frames, and screw fastened to same. They are to be reinforced with an oak breasthook at the stem and a knee on each side of the stern. Planking battens are to be of yellow pine. They are to be 7/16 by 1⅜ inches on the side and 9/16 by 1¾ inches on the bottom. They are to be properly aligned so that the plank seam will meet the center of the battens as let into the frames and securely screw fastened to the same. On the bottom the fourth and fifth batten may end in the chine. Trim and bevel properly in readiness for the planking.

Frame in General: The entire frame is to be neatly trimmed and faired in readiness for the planking. All joints as made during the construction are to be well painted with lead paint before being finally fastened. All galvanized bolts are to be painted with red lead and where exposed to be wood plugged.

Planking: Planking is to be of white cedar, pine or cypress if the hull is to be painted and of mahogany if the hull is to be finished natural. It is to be 7/16 inch thick on the sides and ½ inch thick on the bottom. Planks are to be spiled so that the seams will meet on the center of the battens. They are to be in as long lengths as practical and all butts are to be made on



Mold sections for the after sections of Fleetfoot



A necessary drawing, the construction profile and deck beam plans

oak butt blocks to have at least six fastenings on each side of the joint. The planking is to be screw fastened to the frame with 1¼-inch No. 9 screws on the sides and 1½-inch No. 9 screws on the bottom. One-inch No. 9 screws used to stem, stern, keel, chines and clamp. The seams on the sides to be flush and blind caulked. A small groove should be made in each plank edge on the center and a strand of soft seine twine inserted. The chine and bottom seams are to be lightly caulked with spun cotton rolled in and not hammered. All fastenings are to be counterbored with a ⅜-inch Forstner bitt and wood plugged.

Deck Beams and Framing: The beams on station frames are to be ⅞ by 1¾ inches, the intermediates ⅝ by 1¼ inches. The hatch trimmer is to be of ¾ by 2¼ inches, as well as the header beams forward and aft of the hatch opening. The cockpit trimmer is to be of ⅞ by 2 inches and all are to be of white wood. The filler block where indicated is to be of oak. All beams are to be sawn to a proper radius and securely screw fastened to the frames and clamp. They are to have supporting knees on each frame and to be bound with ⅜- by ⅞-inch oak, screw fastened. There will also be a small knee on each beam to extend to the second batten. There will be a bulkhead on station No. 3 of 5/16-inch Haskelite securely screw fastened to the frame and caulked. All beams are to be faired and trimmed in readiness for the decking. Hatch cover frame is to have ¾- by 1¾-inch framing and ⅝- by 1½-inch small beams. There will be a ⅜- by 1½-inch wind strip as indicated on the plan screw fastened to the beams. There will be a rest strip on each header beam to support the hatch covers of ½- by ½-inch oak, screw fastened.

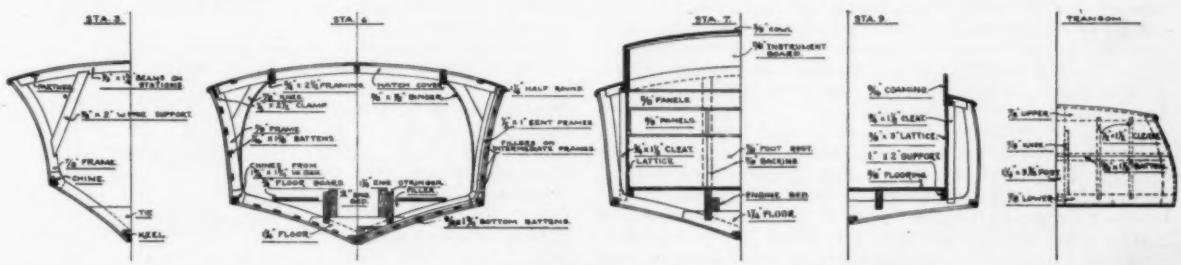
Decking: The center plank to be ⅓-inch. The covering boards of 7/16-inches and the balance of the decking 7/16- by 2½-inch strips. The covering board and the center plank are to be screw fastened while the strips are nail fastened to the beams with 1½-inch galvanized nails. Screw fasten these to the partner. There will be two fastenings in each strip. The hatch cover is to be finished in a like manner. All decking is to be counterbored and wood plugged, allowing a uniform seam of about 3-32 inch, which should be lightly caulked with spun cotton.

Cockpit: The bulkhead in the cockpit to be ⅝ inch and in one continuous piece in alignment with the bottom of the coamings. It is to have three panels backed with a ¾-inch backing piece in alignment with the engine stringers and fastened to same to be divided with a ¼-inch nosing piece. The coamings are to be ⅝ inch, and the seat back ¾ inch. There will be a ⅝-inch instrument board, as indicated on the plan, with two cleats on each side to be covered with a ⅜-inch cowl. The flooring is to be of white pine as shown and footboards of ⅝-inch, made in three removable sections, should be fitted. Flooring forward of the seat should be fitted and all screws fastened. The after flooring is to have two permanent pieces and a removable cleated section which shall rest on stringers and be supported on each side with a cleat fastened to the frames. There will be a seat forward made up with a solid ⅝-inch front and back with ⅞-inch cleats for support. The front and back piece on the top as well as the dividing piece, which should have a cleat on the bottom to support the removable cover, are to be of mahogany. The cover may be of white pine. There will be a removable after seat with a mahogany front and a pine top, to be supported with a post in the center. All decking in the cockpit finish, except where otherwise specified, should be of mahogany. The sides of the cockpit are to be either lined with 5/16- by 3-inch strips or to be finished open.

Fender: There will be a 1¼-inch half-round mahogany molding forming a fender strip. This will be screw fastened and wood plugged. It is to be slightly tapered at the stem and stern and aligned approximately ¼ inch below the deck.

Finishing and Painting: The entire hull is to be thoroughly dressed and sand-papered. The bottom and chine seams are to be lightly caulked, then followed with a coat of hot oil composed of ⅔ boiled linseed oil and ⅓ turpentine applied boiling hot. The bottom seams should then be filled with a composition of dry lead and spar varnish mixed to the consistency of putty.

(*Continued on page* 96)



Construction sections at all necessary stations of Fleetfoot, the 22-foot runabout

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the November Prize Contest

1. Describe a water supply system to galley sink; location of tank, method of running piping and means provided for filling and cleaning out the tank.

(Submitted by H. H. P., Oakland, Calif.)

2. Explain and illustrate the strongest and best rudder construction and installation for a cruiser.

(Submitted by W. B. M., Newburgh, N. Y.)

Rules for the Prize Contest

ANSWERS to the above questions for the November issue, addressed to the editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before September 25, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before September 25. The Editor reserves the right to make such changes and suggestions in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are two prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer both.

For answers we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

Improvements For Hard Starting Motors

Suggestions on Helping the Engine Which is Difficult to Get Going and Devices Which Will Ease the Effort Needed

Answers to the Following Question Published in the July issue

"What have you done to lessen the labor or annoyance of starting your motor boat? Illustrate with sketches if necessary."

Select Auxiliary Devices with Care

(The Prize-Winning Answer)

A BASIC fault with most devices and methods for readily starting marine motors is that they do far more than merely start the motor in short order. For instance, one type of motor-wise boatman prescribes a treatment that he guarantees infallible, provided there is any kind of ignition spark. With the air of a surgeon conducting an operation, he injects a few drops or spoonfuls of ether through the cylinder petcocks or carbureter air intake. As predicted, a motor with even a semblance of an ignition and carburetion system generally gives a few abrupt coughs and starts hitting right audibly in response to this treatment. Mayhap a pounding noise or squeak in the cylinders or an odd row of bubbles or black streaks along a removable cylinder head gasket after this form of quick start are unnoticed or ignored. But these results are generally there in at least some degree. Ether is too much of a good thing when used as a priming or volatilizing agent in starting. It often produces such a violent explosion that cylinder heads are loosened, gaskets torn, valves warped or sprung, and the oil-film below piston head destroyed. Besides, it costs many times as much as gasoline, is extremely inflammable, and soon evaporates unless carefully stored.

High-test gasoline, similarly used, or shot through a control board-mounted primer has faults in common with ether, though less pronounced. Unless the gas going through the carbureter is particularly weak, there is little gained in the introduction of high test gasoline when temperature is not below 45 degrees F. In severe cold, its higher volatility affords a few practical starting advantages for gas that tests, say, 65 degrees or better. But here again are added expense and fire risk.

Various electrical heating pads or coils have been designed for application to the carbureter or manifold. The amount of current required to heat the resistance wire in outfits of this kind produces a serious drain on the battery in the average installation. When the boat is large and carries a big inbuilt lighting plant with a heavy duty generator and quantity of strong batteries, this objection does not apply. Although these electric mixture warmers provide an efficient form of hot spot for quick starting, the risk of shorts in the thin wires so close to the carbureter and gas line is not condoned by insurance inspectors.

Another method of warming up gas on its way to the cylinders is to hold against manifold or carbureter asbestos pads which have been heated on the open flame of the galley stove. This is a rather slow, inconvenient process, and, should the pads be frayed or dirty at any point, a lingering spark is liable to ignite gasoline about the carbureter.

Attacking the starting problem from ignition standpoints also has been done in many ways. An extra strong battery, such as the hot shot dry cell type, may be switched in for starting with good results. Prevention of such starting difficulties as oil- or water-soaked wiring, spark plugs, battery or magneto, and coil being mainly just a matter of careful design and installation, such troubles are rare, save in antiquated lay-outs. Sometimes, however, a cold snap will so chill a battery that its strength drops nearly to zero. Any method of heating its cells to a moderate temperature, provided it is not too direct (as placing almost in contact with a flame or a scorching exhaust pipe), generally makes it pick up rapidly.

Such starting measures as setting spark plug points abnormally close, advancing the spark half-way or more, reducing magneto or distributor breaker gaps, over-flooding or tight choking of the carbureter, are but temporary makeshifts and have a deterrent effect on subsequent running of the motor. Dangerous backfires are often caused by such actions.

The spark intensifiers on the market, whether attached inside or outside the spark plugs, or designed as an integral part, have no practical value as starting aids, although their ability to hold back and bunch up the secondary current shots on the auxiliary gaps make an oil-pumping, leaky, carbonized cylinder hit steadily after spasmodic warming up when the conventional spark plug would fail to do so.

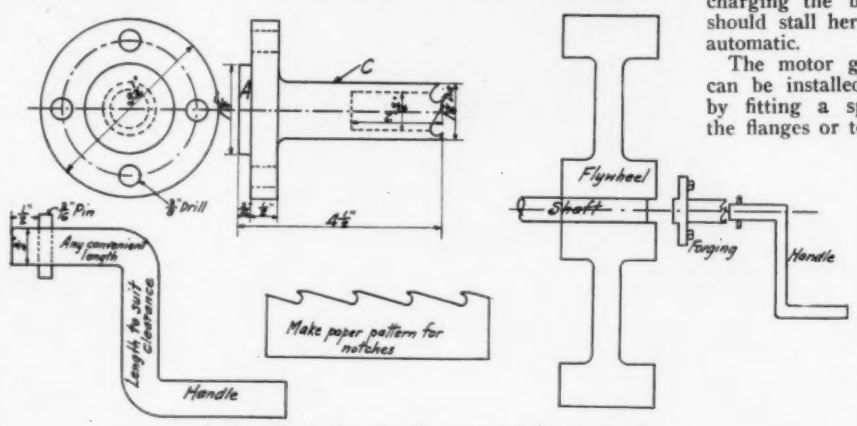
The foregoing starting methods and kinks are all more or less objectionable on the whole. Another safe, practical plan I have often used consists in carrying a Thermos or

vacuum bottle full of hot water on all trips. Where the carbureter air inlet is not directly exposed, a little hot water is poured directly on the carbureter and intake manifold. When water is likely to enter the carbureter, the intake is covered with a cloth or small wooden block during the hot water cure. Spattered drops are wiped off adjacent parts. At least tepid water is available for nearly twenty-four hours if required. For ordinary motors, rarely is more than a third of a quart bottle required at a time to provide a warm, shootable mixture of gas, which is the most variable and troublesome factor in starting. A quick method that often suffices is merely to hold a cloth around the vacuum bottle filler for a moment, then place the hot cloth around carbureter and intake manifold. A common fire extinguisher bracket holds the Thermos bottle on the motor rail.

D. McC., Cleveland, O.

A Good Starting Handle

THE cruiser with an electric starter needs no improvements for starting so long as the starting system is in order, and is usually provided with a better hand starter than can be built. However, on the average small cruiser, the motor is usually enclosed, being either hatched over or under the cockpit floor, and to start requires either the removal or opening of numerous combinations of doors or covers; taking hold of the rim of the flywheel, rocking it either in the direction of, or against, compression until one of the pistons comes into the firing position and starts. To avoid this inconvenience, the following device was made:



Improved starting handle suggested by J. K. S.

The face of the hub of the flywheel, if not already faced off, should be turned true on a lathe. Drill and tap for ⅜-inch cap screws, location being taken from diagram, a piece of either cold-rolled or tool steel 3¼ inches in diameter and 4½ inches long may be forged to the approximate dimensions necessary, and then finished in a lathe, or the whole job may be done in a lathe. If the face of the flywheel hub is even with the end of the crankshaft, then omit the shoulder A.

The notches in the end of the forging are made by drilling two 3/16-inch holes at right angles to each other, passing through the center line, and located 5/32 inches from the end. The notches are then made by filing the notch as shown.

The handle is made by bending a piece of ¾-inch cold-rolled steel as shown, drilling and driving a 3/16-inch pin as shown, or an old auto starting handle may be used. When finishing the notches, try the handle from time to time, filing until it releases readily. The shank of the forging may be used for a forward starter pinion at some later date, speed counter or pulley for the generator may be attached. The notches may be left soft or slightly case-hardened.

This device has given the best of satisfaction on a 14 h.p. motor, and has made a motor which was always a hard starter into one that is a joy to start. Although no provision is made for back firing, yet with the leverage available, the motor can be turned over so quickly that there is little danger of back firing. With this device the uncovering of the motor is unnecessary.

J. K. S., Schenectady, N. Y.

Good Condition Essential

AN easy starting motor must invariably be in good mechanical condition. The pistons must be a good fit in the cylinders, and the piston rings must effectually maintain the seal between combustion chamber and crankcase, and the valves must close tightly. Proper carbureter adjustment is essential to easy starting, and the choke must close the air intake in order to spray gasoline through the nozzle. Poor ignition will often make a motor in good condition exceedingly hard to start. The remedy is obvious and, after it is properly overhauled and adjusted, a few turns of the crank or starter should start it off.

It is no trouble to start a motor in good condition, and the man who finds it annoying to start the modern marine motor is not of the sort that make real boatmen. The average motor boat enthusiast enjoys starting the motor when it goes off on the first turn and don't stall when the clutch is thrown in. When the motor stalls is the only time that starting is an annoyance.

An electric starter will reduce the labor of starting the motor to a minimum. It is only necessary to adjust the controls, throw the ignition switch, and press the starter pedal. On some systems it is only necessary to close the ignition switch and the starting motor turns her over until she picks up; when it automatically acts as a generator, charging the battery. If you should stall her, the starting is automatic.

The motor generator system can be installed on any motor by fitting a sprocket between the flanges or to the crankshaft end and attaching the motor generator on brackets either to the motor itself or to the foundation. A starting motor may be attached in place of the crank on the rear starter and the generator driven separately.

There is an acetylene device on the market which the manufacturers claim will start any engine instantly. An acetylene nozzle is tapped into the intake manifold and connected by annealed tubing to a compressed acetylene tank. The motor starts on the first spark and is kept running until it picks up on the regular fuel. This device in connection with an electric starter should make an ideal starting motor under all weather conditions.

In cold weather any of the well designed preheating or priming devices will greatly facilitate starting the cold motor.

When a motor does not start after a few turns, it is useless to continue cranking without looking for the trouble. Given an explosive mixture and a good spark at the proper time, any engine will start without trouble. Look carefully to the carbureter adjustment and the condition of the breaker points or vibrators. Breaker points too far apart, dirty, or badly pitted will make it exceedingly hard and sometimes impossible to get the motor running. Fouled spark plugs and cracked porcelains also contribute their share towards hard starting and sometimes function properly after the motor is running under load.

Badly worn pistons, poor fitting rings and leaky valves either collectively or separately will cause hard starting. This condition may be helped somewhat by squirting a little heavy oil into each cylinder and priming liberally. A 50-50 mixture of ether and gasoline may be effectually used for priming, especially in cold weather. However, such a motor should be overhauled and new parts fitted or the motor replaced.

W. B. M., Newburgh, N. Y.

Iceless Refrigerators

Novel Methods of Cooling Perishables on Board a Small Boat Without the Use of Ice

Answer to the Following Question Published in the July Issue

"Illustrate with sketches an inexpensive iceless refrigerator cooled by evaporation or other scheme which may be built by the boat owner"

Cooling by Evaporation

(The Prize-Winning Answer)

GOOD meals are essential to the good spirits of the crew, and the success of any cruise or week-end party depends largely upon the crew keeping happy. On the small cruiser an ice box of sufficient capacity to keep cool for several days without replenishing the ice supply is hardly practical. When cruising or camping away from populated districts, ice is seldom obtainable. Still, perishables must be kept cool and fresh.

A temperature of 50 degrees is generally considered safe for fresh meats, butter, eggs, etc., for a few days. Unopened can goods do not require refrigeration, but they will spoil if stored in a hot place for any length of time. The water refrigerator is the most practical means of keeping down the temperature without ice or mechanical refrigeration. The articles to be cooled are placed in air-tight containers, which are kept in a slat or light wood frame box covered with wire cloth, such as is commonly used for window screens. On top of the box is placed an earthenware dish partially filled with cool water. The entire box is wrapped with burlap, toweling, or other absorbent cloth, the ends of which are immersed in the dish, and the refrigerator placed in the shade in such a position that a current of air can circulate around it. On the shady side of the boat, in front of a port hole having a wind scoop or under a ventilator will be satisfactory.

A modification of the water refrigerator may be adapted for bottles of milk, cream, etc., by wrapping them in wet cloths and placing the bottles in an earthen dish of cool water.

Such articles as meat, butter, or eggs may be kept cool by placing them in air-tight containers and inverting an ordinary unglazed flower pot over them instead of the wrapping. Prepare the refrigerator morning and night by supplying the dish with fresh cool water.

Two earthen crocks, the outer one of double the capacity of the inner, and unglazed, will make a satisfactory cooler. Blocks are provided to raise the inner crock and the space around it filled with cool water. Osmosis will keep the outside damp.

When a permanent fixture is desired, make a copper, zinc, or galvanized iron box having a tight-fitting lid. Provide a metal pan three inches deep and having a three-inch clearance, into which the box is to stand. Around the box wrap several layers of loose woven cloth, toweling or burlap, allowing it to extend to and spread out on the bottom of the pan. Refrigeration is not accomplished by making cold, but by the extraction of heat, through the expansion of a liquid into a gas or by evaporation. The expansion of cooled compressed air (dense air system) is also employed in mechanical refrigeration.

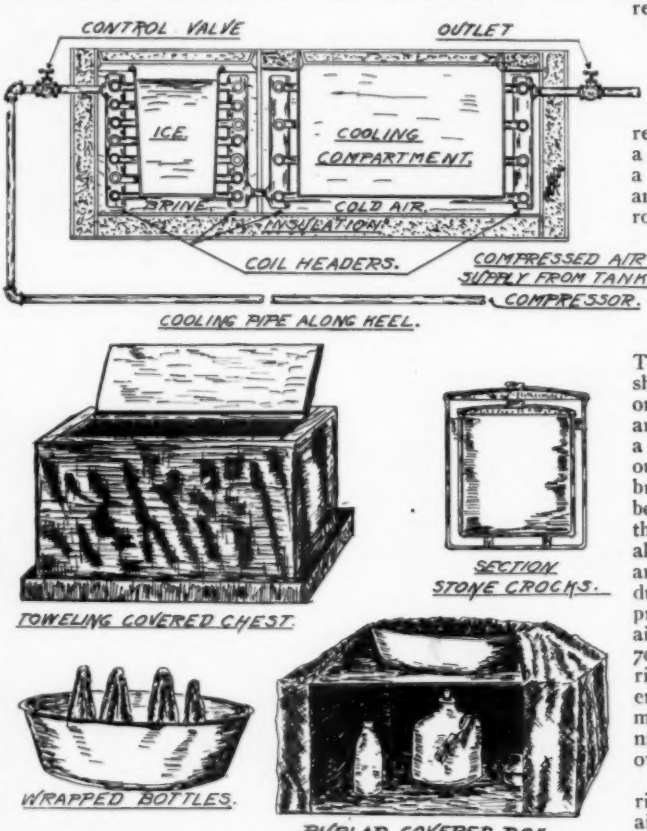
The water refrigerator operates on the principle that evaporation absorbs heat, and as the water evaporates from the wrapping, heat is absorbed from the nearest source, which is the container and its contents. As the water evaporates it is replenished from the pan by the capillary attraction of the wrapping, and the process is continuous.

In northern waters considerable cooling effect may be obtained by the circulation of sea water through pipe coils placed in a cooling box. The circulation will be natural and continuous if the inlet is placed well down towards the keel and the outlet 3 or 4 inches below the waterline. As the water absorbs heat from the box it rises and is replaced by cooler water.

On larger cruisers the whistle pressure pump may be used in connection with a modification of the compressed air refrigeration system. Make a refrigerating box having a cooling compartment and an ice-making can. Surround the cooling compartment and ice can with pipe coils so that there will be more area on the ice-making side, and provide an outlet at the end of the coil. The space around the coils should be filled with brine or other non-freezing preparation and provided with a vent and filling plug. The outfit will work without the brine, but the operation will be a little slower. From the air tank run a pipe along the keel to the coils and provide a valve for reducing and controlling the pressure at the coils. An air pressure of from 50 to 70 pounds will be about right, and a little experience will enable you to make enough ice while running to keep the box cool over night.

Air, when compressed, rises in temperature. The air is cooled by passing through the pipe along the keel or through cooling chest and allowed to expand in the refrigerating coils. As the cooled compressed air expands to atmospheric pressure, considerable heat is absorbed and a freezing temperature is not hard to obtain. Another thought for the simplest way of keeping provisions cool for a time is to chill them thoroughly and stow them in a device similar to a fireless cooker. This will keep things cool for a considerable time after the fashion of the well-known thermos bottles.

W. B. M., Newburgh, N. Y.



W. B. M. designs an iceless refrigerator and also offers other valuable schemes

Mercator Sailing

The Theory and Construction of a Mercator Chart, and the Method of Finding the Difference of Longitude and the Course by Mercator Sailing—The Seventh Lesson of a Correspondence Course Which Will Be a Complete Treatise on the Subject of Dead Reckoning

By Dean Potter

Chairman, Committee on Instruction, United States Power Squadrons, Inc.

THE earth is a spheroid, and, therefore, is not a developable surface. A developable surface of a solid, as Mr. Binns puts it, is one upon which a flexible but non-elastic material, such as a sheet of paper, may be bent so as to apply evenly and without vacuities. It may be thought of as a surface which is capable of being unrolled or flattened out without distortion. A hollow cone, for instance, may be cut from apex to base and unrolled. So a cylindrical surface may be cut lengthwise and flattened out. But this cannot be done with a sphere. The surface would bulge or wrinkle; there would be stretching and distortion. Thus it is impossible to perfectly represent a sphere on a flat surface, such as a sheet of paper; and no perfect flat map has ever been made. Map-makers, with rare skill and ingenuity, have worked out various projections, all having certain distortions, but each with advantages for special purposes. For instance, the polyconic projection is useful for delineating small areas, and has but little distortion. But it is not available for large stretches of territory. The gnomonic projection is distorted to an extraordinary degree, but it has the virtue that a great circle may be represented upon it by a straight line.

The Mercator is also a much distorted projection, especially in high latitudes. But it has the property that distances and differences of latitude and longitude may be measured directly from the accompanying scales, and that a straight line ruled upon it represents a rhumb line upon the earth. The angle between a rhumb line and the meridian, is the rhumb course, which corresponds with the true compass course. Thus the chart is admirably adapted for ascertaining the course to be made good, to carry a vessel from place to place. Also a great extent of territory may be shown upon a single chart.

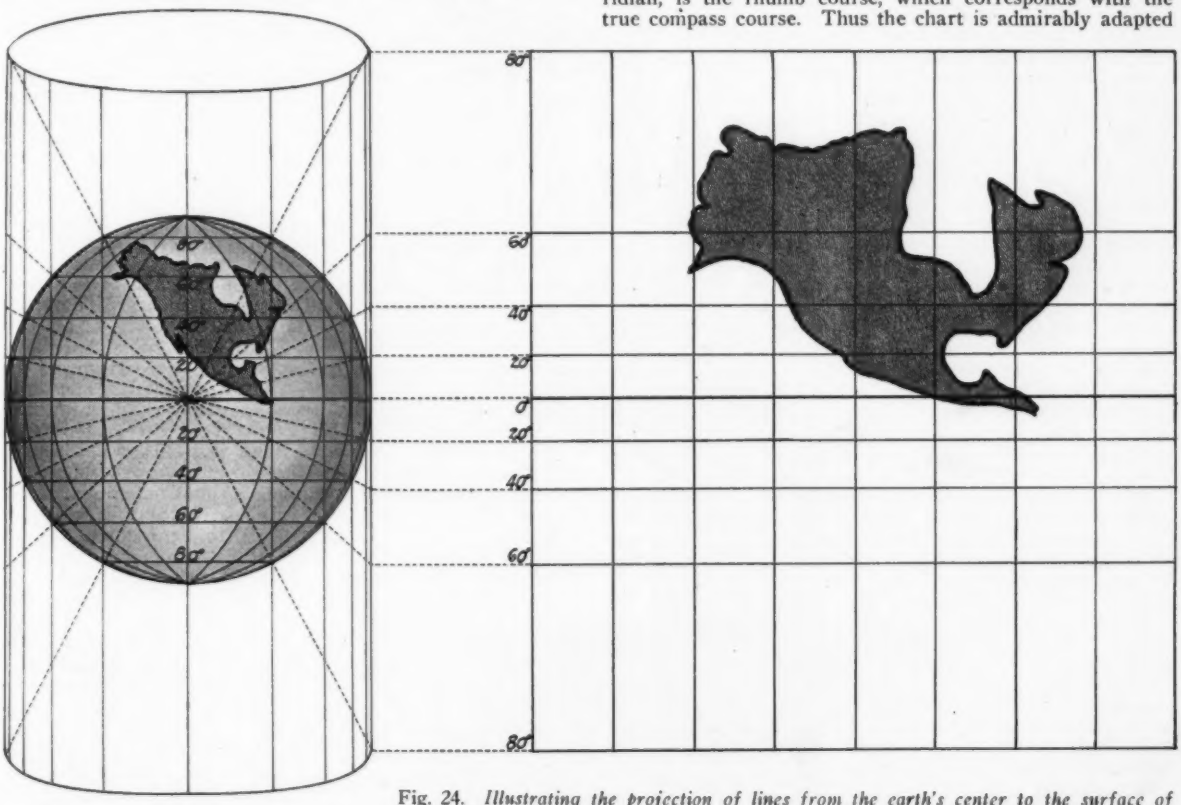


Fig. 24. *Illustrating the projection of lines from the earth's center to the surface of a cylinder, tangent to the earth at the equator. The distance between the parallels of latitude is expanded as the latitude increases. The meridians appear as parallel lines upon the tangent cylinder. The cylinder cut lengthwise and unrolled, forming the frame of a Mercator chart*

The Mercator projection is named from Gerard Mercator, who lived in Flanders between 1512-1574, and who published a chart in about 1556, the peculiar features of which were that the meridians were parallel lines, and the distances between the parallels of latitude were proportionately extended as the latitude increased. Mercator left no explanation of his theory, and it is generally supposed that he never discovered the true principles upon which the present so-called Mercator projection is founded. It is sometimes thought that he worked out his chart to harmonize with the proportions appearing on terrestrial globes, where the spaces between parallels and meridians become oblongish and narrow in the higher latitudes. Credit for evolving the theory of the chart is generally given to Edward Wright, an Englishman, who constructed a table of meridional parts, which was the forerunner of the tables in use today.

The Mercator chart may be thought of as a projection from the earth's center upon a cylinder tangent to the earth at the equator, as in Fig. 24. The eye of the observer being at the center, it is in the plane of all great circles, and the meridians would appear as straight lines. These carried out to the tangent cylinder would become parallel straight lines upon it. The equator would cross the meridians in a straight line and at right angles thereto. The parallels of latitude projected out to the surface of the cylinder, would appear as straight lines, parallel with the equator, but would be spaced farther and farther apart as their latitude increased. In the polar latitudes, this increase would become enormous, and the cylinder would have to be very long in order that the projected lines might touch it. The pole itself would be a point in the center of the cylinder, and the projected line through it would never meet the cylinder. Thus, the pole could not be shown on the projection, nor would it be practicable to show regions near the pole, because of the extraordinary length of the cylinder which would be required. Now imagine this cylinder with these projected lines upon it, to be cut lengthwise and unrolled. It would then appear as in Fig. 24, and become the framework of a Mercator chart, upon which the geographic features might be delineated. (See Bowditch, p. 20-1.)

Or, with William Garnett, we might fancy a globe, with the geographical features worked upon it, to be cut open along the lines of the meridians, and then flattened out, as in Fig. 25. Imagine the globe to be composed of malleable metal. Then suppose the various sections to be hammered out, becoming longer and wider until the margins were parallel and exactly touched each other. Near the equator but little hammering would be required, but as the latitude increased, the widening and elongation would be more and more. Near the pole it would be very great. The pole itself, being a mere point, could not be hammered out, and it would be necessary to cut the ends off sufficiently to keep the expansion within workable limits. When finished these expanded strips, widened and lengthened, with the geographic features similarly expanded, would resemble a Mercator drawing.

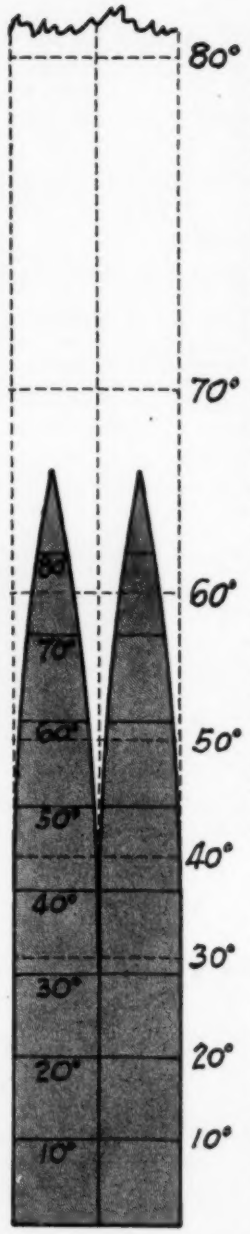


Fig. 25. *The heavy lines show a portion of the globe cut open along the meridians. The dotted lines indicate how the sections are widened and elongated on the Mercator chart*

Perhaps some one may deem these illustrations to be most unscientific. We shall be willing to stand the opprobrium, if they serve the purpose of making the matter graphic. They may aid the student in visualizing some of the common characteristics of the Mercator projection, which are:

1. The meridians are parallel, and the scale at the top or bottom of the chart always represents longitude, or the arc between meridians.

2. The scale of the latitude is expanded to keep step with the widening out of the meridians. Thus the greater the latitude, the greater the spacing between the latitude parallels, for the reason that the farther the distance from the equator, the greater has been the expansion of the space between the meridians. And yet the space on the chart represented by each minute of latitude always equals a nautical mile. Thus the latitude scale at the side of the chart may be used to measure not only latitude, but distance; provided we do our measuring in the immediate vicinity of the particular parallel represented by that scale.

3. The expansion increases as the latitude increases. The expansion affects not only the bodies of water, but all geographical features of the earth. Thus, in very high latitudes, they may appear to be several times their real size. But since everything in that same locality is similarly expanded, the proportions between neighboring objects are fairly well preserved. For instance, Iceland, lying far to the north, is made to appear more than twice its true size, and looks much larger on the map than Cuba, when in fact it is smaller. (Cuba, 45,881 sq. mi.; Iceland, 40,456 sq. mi. New International Encyc.) The scale of the chart at one place could not be applied to the other. And yet the chart gives a good idea of the shape or configuration of both places, and the dimensions of each may be measured from it, by using the scales which apply to the respective localities. Some wag has remarked that an Englishman always likes to see the British empire delineated on a Mercator map, for it makes Canada look larger than the United States, and the mother country half again as big as it really is.

4. The rhumb line is a straight line on a Mercator chart. A rhumb line is one which crosses the successive meridians at the same angle. On the earth, the meridians converge, and thus a line crossing them at the same angle must be curved, as we saw in the first lesson. But on the Mercator chart, the meridians are parallel, and a line crossing them at the same angle must be straight. Hence the rhumb line on the earth is curved, while on the Mercator chart it is straight. And herein is the projection of especial use to the navigator: the rhumb course, or true compass course, from place to place, may be indicated by simply ruling a straight line connecting them.

We do not wish, in these lessons, to dwell too much upon mathematics. But the mathematical theory of the Mercator projection, with its accompanying table of meridional parts, is not difficult; and a brief explanation of the essentials, for which we are in part indebted to Prof. J. R. Young, may prove helpful.

As stated above, the first table of meridional parts was devised by Edward Wright. Since the meridians on the Mercator chart are opened out so as to become parallel, the spaces between the parallels of latitude are also expanded in proportion. Latitude is arc of the meridian, and the increased values of the meridian, representing these expanded latitudes are called meridional parts. The table of meridional parts in Bowditch (Table 3) shows the length of each successive minute of latitude, increased so as to be in correct proportion with a minute of longitude on the equator, where a minute equals a mile.

Let Fig. 26 represent our familiar

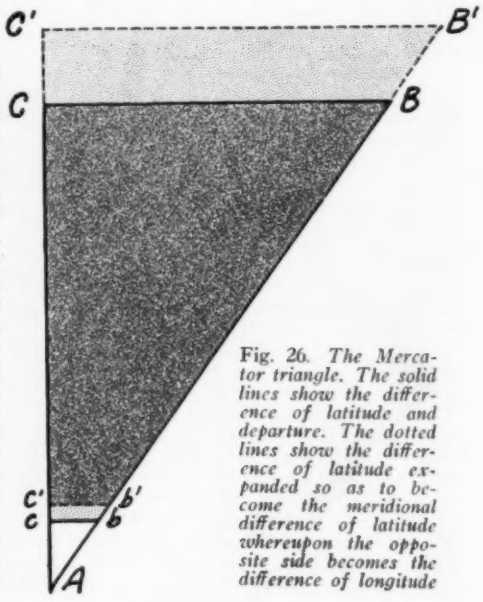


Fig. 26. *The Mercator triangle. The solid lines show the difference of latitude and departure. The dotted lines show the difference of latitude expanded so as to become the meridional difference of latitude whereupon the opposite side becomes the difference of longitude*

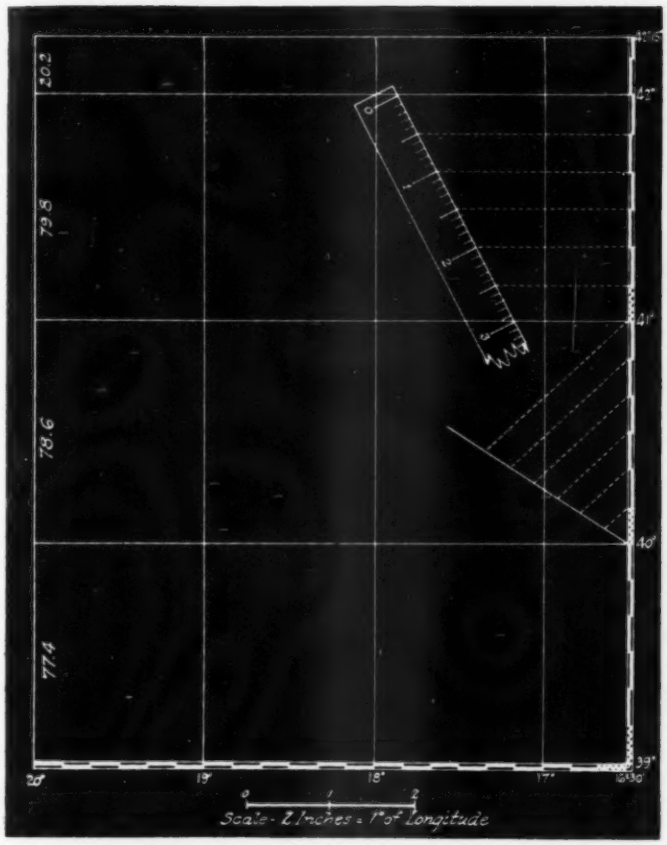


Fig. 27. *Illustrating the construction of a Mercator chart*

dead reckoning triangle, AB being the distance run, AC the difference of latitude, and CB the departure. As we saw in the last lesson on Middle Latitude Sailing, the departure CB may be conceived of as the aggregate of all the minute departures shown on the diagram, Fig. 23. We may fancy these elementary triangles to be so infinitely small that each would have no sensible difference of latitude. Let Acb represent one of the elementary triangles in that diagram, cb being its departure and Ac its difference of latitude. Then as heretofore shown,

D Lo = Dep cos Lat

That is to say, the cosine of the latitude expresses the proportion between the departure on a given parallel and a similar portion of the equator, where, as repeatedly said, a minute equals a mile. Now let the elementary triangle be expanded, till the departure c'b' equals the difference of longitude. Now we have made two triangles. The smaller represents the true difference of latitude and departure. In the larger, the departure is expanded so as to represent the difference of longitude, with the difference of latitude also expanded in corresponding proportion. But these two triangles are similar, and their corresponding sides are proportional

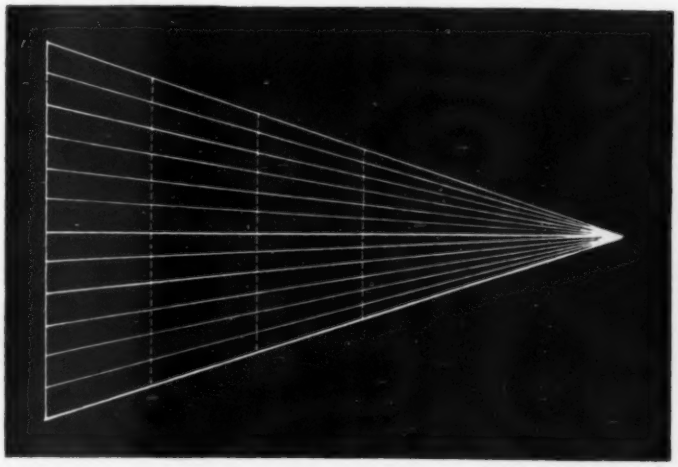


Fig. 28. *A proportional scale, useful in dividing lines into a number of equal parts. The dotted lines should be held parallel with the line to be divided, otherwise the divisions will not be equal*

(Lesson 2). Thus the proportion between DL and DL expanded, will be the same as between Dep and D Lo. Or, we may say:

DL : DL expanded : : Dep : D Lo

Now, if Dep sec Lat = D Lo,

then DL sec Lat = DL expanded, that is, the difference of latitude expanded in the same proportion in which the departure must be expanded in order to equal the difference of longitude.

Now suppose we wish to draw to scale a chart represented by the sailing from A to b. If, instead of drawing it as Abc, representing the true difference of latitude and departure, we expand the difference of latitude to Ac', then the corresponding dimension c'b' would represent, not the departure, but the difference of longitude.

As Prof. Young says: "It is evident that if all the elementary differences of latitude are prolonged in this manner, the sum of all the corresponding increased elementary departures will be the whole difference of longitude in sailing from A to B. Consequently to represent the difference of longitude between A and B, the difference of latitude AC must be prolonged till the length AC' becomes equal to the sum of all the increased elementary differences of latitude, when the corresponding increased departure, C' B', will represent the difference of longitude made in sailing from A to B."

Taking the elementary differences of latitude to equal a nautical mile, or one minute of the meridian, commencing at the equator, and calling the enlargements meridional parts, then

Meridional parts of $1' = \sec 1'$
" " " $2' = \sec 1' + \sec 2'$
" " " $3' = \sec 1' + \sec 2' + \sec 3'$,
etc., etc.

And from these equalities, Wright calculated the proper enlargement of the portions of the meridians, increasing minute by minute, from the equator, by help of the table of natural secants, thus:

	Lat.	Sum of nat. secants.	Mer. Parts.
Mer. Parts of $1'$	= 1.0000000		= 1.0000000
$2'$	= 1.0000000	+ 1.0000002	= 2.0000002
$3'$	= 2.0000002	+ 1.0000004	= 3.0000006
$4'$	= 3.0000006	+ 1.0000007	= 4.0000013

etc., etc.

It was by summing up the natural secants in this way that the first table of meridional parts was constructed. But such a table took no account of the compression of the earth, that is, of the fact that its equatorial diameter is greater than the polar. The present tables, however, take this and other factors into account, with the result that a highly accurate table is now available to the navigator.

For practical purposes, we may think of a table of meridional parts as expressing the value of the latitude, or arc of the meridian, increased to preserve the proportion between them and parallel meridians of longitude, on the basis of a minute of longitude equaling a mile. Or, if we take a mile or minute at the equator as the base, and extend parallel meridians therefrom, such meridians would have to be of the length shown in the table of meridional parts, in order that the correct proportion between latitude and (*Continued on page* 137)

Export Conditions and Prospects

Foreign Markets for Boats and Engines Show Signs of Awakened Activity, Reports From All Quarters of the Globe Are Encouraging

By B. Olney Hough

MUCH food for thought and satisfaction is to be found in the present status of our export trade in motor boats and marine engines. In these lines, as in practically every other line of American manufactured goods, a distinctly optimistic atmosphere has been apparent since last January. More orders and a great many more inquiries began to be received by American manufacturers about the first of the year. The orders were, of course, highly satisfactory, but the increased number of inquiries, in many cases from foreign markets which had not been heard from for many months before, ought to have been regarded as a peculiarly satisfactory development, indicating that buyers were beginning then to contemplate investments in new merchandise. The trend upward which began in January, after more than a year of dullness and depression, did not at first, of course, manifest itself in our export trade statistics, because even when orders were received they could not be dispatched immediately, and many of them involved much later shipment.

Our great New York banks which specialize in financing foreign shipments did not themselves begin to appreciate the improvement in trade until late May or early June, when documentary drafts for discount here, or for collection abroad, began to flow in to the banks at three times the rate of many previous months. This applies to drafts covering all kinds of merchandise, of course, not merely to those of the motor boat and marine engine trade.

We may get an idea of the actual improvement in the trade which is of present interest to us by considering the figures of actual shipments of gasoline marine engines from January to June of 1922. It is better to take gasoline marine engines as a basis for study because they are more or less a staple export commodity, whereas such things as motor boats have always been and always will be characterized by spasmodic movements in the export trade, required on special occasions or for special purposes in certain markets, thus developing a considerable export movement in one month and very little in some other months.

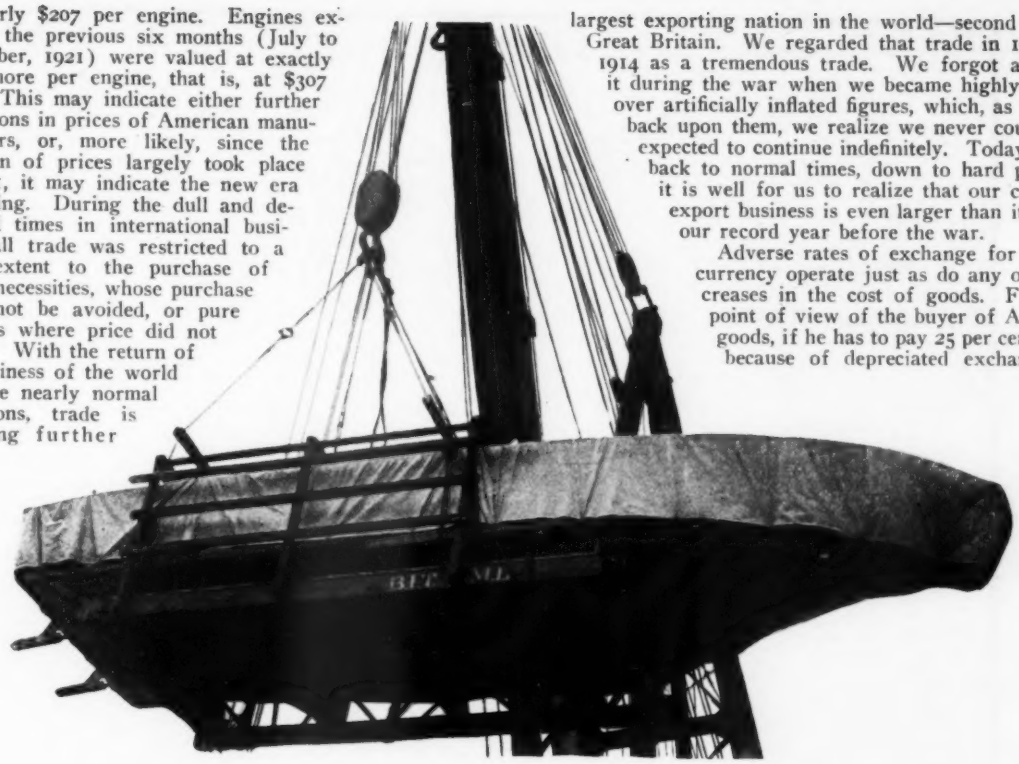
Exports from the United States of gasoline marine engines have improved from month to month throughout the year. Beginning at more than $40,000 in the month of January, exports climbed to $80,000 in March, and from April to June continued in the vicinity of $100,000 per month.

Contrast the export trade in marine gasoline engines for the first six months of 1922 with the previous six months. From January to June, 1922, we exported 2,292 gasoline marine engines valued at $473,747. For the previous six months, July to December, 1921, our exports numbered 1,059 engines valued at $325,110. That is to say, we exported in the first six months of the present year over 1,200 more engines than in the previous six months, valued at about $150,000 more than were our exports for the previous period.

Possibly there is a lesson to be drawn, as characterizing the times, from the average price per engine exported. For the first six months of 1922 our exports were valued

One of the most essential conditions for export shipment is proper packing. The boat shown is well crated

at nearly $207 per engine. Engines exported the previous six months (July to December, 1921) were valued at exactly $100 more per engine, that is, at $307 each. This may indicate either further reductions in prices of American manufacturers, or, more likely, since the deflation of prices largely took place in 1921, it may indicate the new era in buying. During the dull and depressed times in international business, all trade was restricted to a large extent to the purchase of either necessities, whose purchase could not be avoided, or pure luxuries where price did not matter. With the return of the business of the world to more nearly normal conditions, trade is becoming further



characterized by a more liberal buying of utilities and of merchandise for general consumption. It is characteristic of trade in general in practically all countries of the world that merchants are finding their shelves and warehouses empty, and are reconciling themselves to the necessity of having merchandise to sell in order to go on doing business and trying to make their bread and butter. No business man anywhere can continue in business without goods to resell, whether he is in the boot and shoe trade or the gasoline engine trade. Moreover, all around the world people are recovering from the languor and debility which followed the collapse after the feverish times of 1919-20. Reports from almost every country on the face of the globe indicate new courage and new ambition. Enterprises of all sorts sadly need new equipment and it is being bought. Energy in building enterprises, similar to that which we see in the United States, is characterizing other countries also where building and new enterprises in general were at a standstill for several years. Such considerations immediately affect possibilities in the motor boat and marine engine export fields.

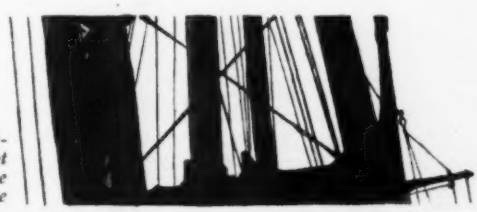
A great many, probably most American manufacturers, find themselves in line with the general public in supposing that conditions in the foreign exchange market not only adversely affect our export trade, but even, in the language of all too many people, have killed our export trade. Nothing of the sort is true. The general export trade of the United States was as big during 1921 as it ever had been in normal times preceding the outbreak of the Great War in 1914. It will be recalled that in 1913 our export trade was the largest in our history, and placed us as the second largest exporting nation in the world—second only to Great Britain. We regarded that trade in 1913 and 1914 as a tremendous trade. We forgot all about it during the war when we became highly excited over artificially inflated figures, which, as we look back upon them, we realize we never could have expected to continue indefinitely. Today we are back to normal times, down to hard pan, and it is well for us to realize that our country's export business is even larger than it was in our record year before the war.

Adverse rates of exchange for foreign currency operate just as do any other increases in the cost of goods. From the point of view of the buyer of American goods, if he has to pay 25 per cent. more because of depreciated exchange for his money, it is identically the same thing as if the manufacturer had increased his prices 25 per cent. All high prices automatically operate to restrict trade, but there never existed, and there never can exist, high prices in general business that will kill trade. Trade always goes on to some extent.

So far as the foreign exchange situation is concerned, it is, of course, very gratifying to realize improvements in the situation and in a good many different directions. Conditions are very much more favorable today than they were a year ago. Practical men, including our principal bankers, deride theoretical solutions of the exchange problem, of which there have been many, ranging from the insane up to the very elaborate and serious. They believe that the problem of the foreign exchanges will gradually solve itself as it has in other crises of the world's history, and they point to existing improvements as indications of approaching convalescence. Incidentally, it is to be observed that low rates of exchange are not universally prevalent throughout the world. Exchanges with Sweden and Switzerland are virtually at par. Dutch exchange is off only 3 per cent. and exchange on Venezuela is at the same point. In a good many of the other exchanges differentials of only 5 per cent. and 10 per cent. are noticeable today as against 25 per cent. and 40 per cent. a year ago.

Even more important than the improvement of the exchanges as affecting merchants' dispositions to buy goods is the new point of view and the new habits of thought which have been adopted. People have become accustomed to looking at the new valuations. For a great number of years the Frenchman had only thought of the dollar as representing approximately 5 francs. He has become

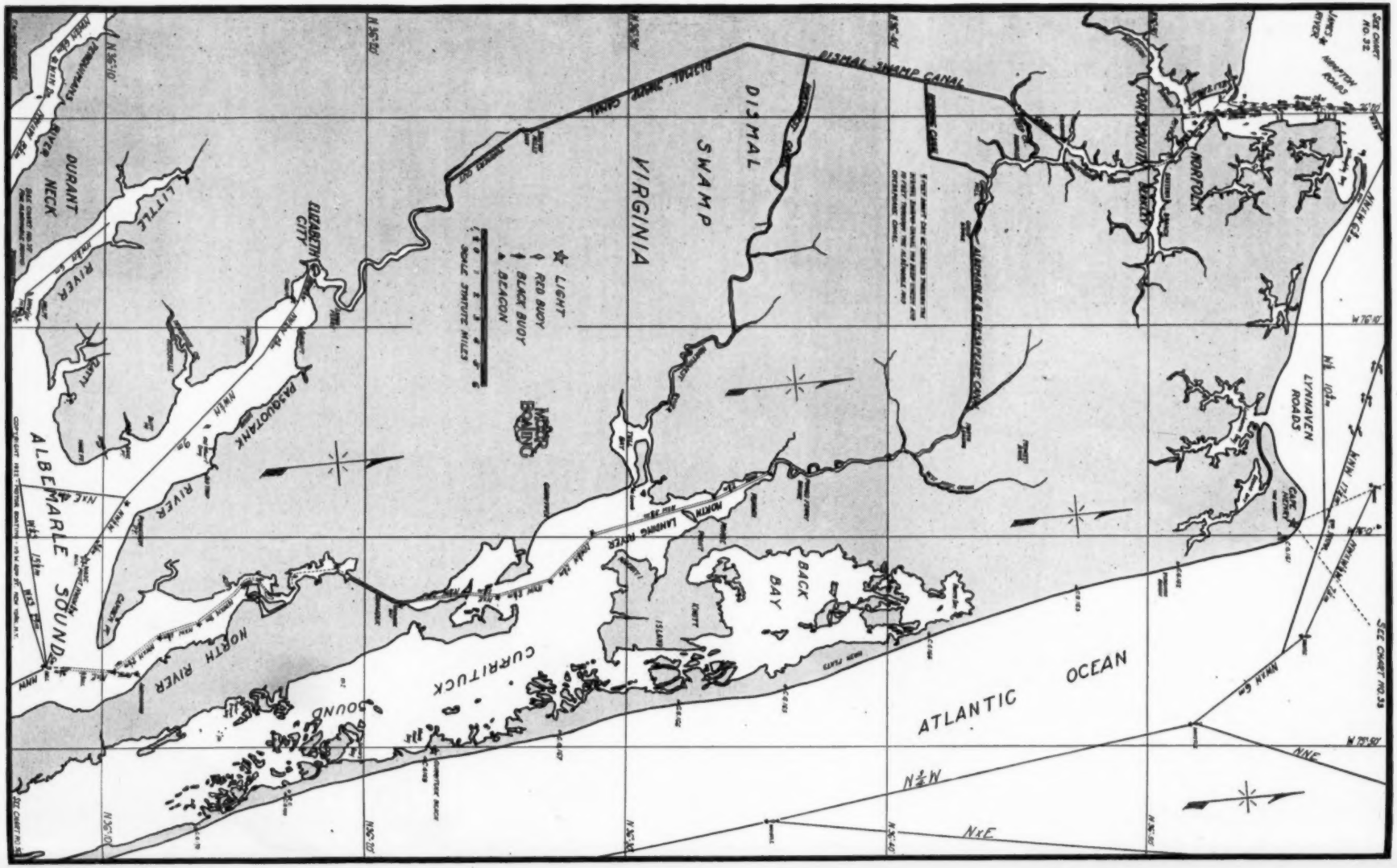
(*Continued on page 122*)



Shipments intended to be carried on steamer decks are not so carefully packed as they are not subject to the same abuse

Motor Boatman's Chart No. 35—Virginia Coast, Cape Henry to Albemarle Sound

For Use in Connection with Coast and Geodetic Survey Charts Nos. 1222, 1227, 1228, 1229



American Manufacturers of Marine Motors

Four-Cycle Gasoline and Kerosene Engines

Allison.....Allison Engineering Co., Indianapolis, Ind.
425 H. P. 12 cyls.

Brennan.....Brennan Motor Mfg. Co., Syracuse, N. Y.
20, 35, 40, 50, 60 H. P. 4-6 cyls.

Buffalo.....Buffalo Gasolene Motor Co., Buffalo, N. Y.
12, 15, 20, 22, 24, 30, 45, 50, 60, 70, 80, 100, 150 H. P. 1-6 cyls.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, N. Y.
16 H. P. 4 cyls.

Caille.....Caille Perfection Motor Co., Detroit, Mich.
14 H. P. 4 cyls.

Capitol.....Auto Engine Works, University & Griggs, St. Paul, Minn.
32, 65 H. P. 4 cyls.

Elco.....Elco Co., Bayonne, N. J.
65, 100 H. P. 4-6 cyls.

Fay & Bowen.....Fay & Bowen Engine Co., Geneva, N. Y.
17, 22, 40, 45, 50, 85 H. P. 4 cyls.

Frisbie (Valve-in-Head)..Frisbie Motor Co., College St., Middletown, Conn.
5, 7, 10, 16, 18, 20, 25, 30, 40, 50, 75, 100 H. P. 1-3 cyls.

Gray.....Gray Motor Corporation, Mack & D. T. R. R., Detroit, Mich. 25, 35, 50 H. P. 4 cyls.

Hall-Scott.....Hall-Scott Motor Car Co., Berkeley, Cal.
125, 200 H. P. 4-6 cyls.

Kermath.....Kermath Mfg. Co., 5880 Commonwealth, Detroit, Mich.
3, 5, 8, 12, 16, 20, 40 H. P. 1-4 cyls.

L-A.....L-A Motor Co., Jackson, Mich.
18 H. P. 4 cyls.

Michigan.....Michigan Marine Motor Corp., 7237 E. Jefferson, Detroit, Mich. 4½ H. P. 4 cyls.

Niagara.....Niagara Motors Corp., Dunkirk, N. Y.
12, 15, 35, 80, 120, 160 H. P. 2-8 cyls.

Palmer.....Palmer Bros. Engines, Inc., Cos Cob, Conn.
2, 3½, 6, 6½, 7, 10, 12, 14, 16, 18, 24, 25, 26, 35, 50, 80 H. P. 1-6 cyls.

Peerless.....Peerless Marine Motor Corp., 2150 Niagara St., Buffalo, N. Y.
6, 12, 20, 24, 35, 50, 125, 250, 400 H. P. 1-12 cyls.

Red Wing.....Red Wing Motor Co., Red Wing, Minn.
14, 20, 24, 36, 40 H. P. 4 cyls.

Regal.....Regal Gasoline Engine Co., Coldwater, Mich.
2, 4, 5, 7, 8, 9, 10, 14, 16, 18, 20, 30, 32, 36, 50, 100 H. P. 1-8 cyls

Scripps.....Scripps Motor Co., 5817 Lincoln Ave., Detroit, Mich.
12, 18, 40, 55, 60, 85 H. P. 4 cyls.

Speedway.....Consolidated Shipbuilding Corp., Morris Heights, N.Y.
28, 44, 66, 75, 115, 130, 150, 165, 175, 200, 250, 300 H. P. 4-8 cyls.

Standard.....Standard Motor Construction Co., 172 Whitton St., Jersey City, N. J.
12, 18, 24, 27, 37, 54, 60, 75, 90, 100, 150, 200, 300, 500 H. P. 2-6 cyls.

Stearns.....Stearns Motor Co., Ludington, Mich.
45, 50, 60, 65, 100 H. P. 4 cyls.

Sterling.....Sterling Engine Co., 1254 Niagara St., Buffalo, N. Y.
10, 15, 25, 55, 85, 100, 115, 125, 145, 150, 170, 200, 225 250, 275, 300 H. P. 2-8 cyls.

Twentieth Century..New York Yacht, Launch & Engine Co., Morris Heights N. Y. 20, 50, 75 H. P. 2-4-6 cyls.

Universal.....Universal Motor Co., Oshkosh, Wis.
12 H. P. 4 cyls.

Wisconsin.....Wisconsin Motor Mfg. Co., 4th and Burman St., Milwaukee, Wis.
24, 40, 50, 60, 62, 90 H. P. 4-6 cyls.

Winton.....Winton Engine Wks., 2116 West 106th St., Cleveland, O.
80, 125, 150, 200 H. P. 6-8 cyls.

Two-Cycle Marine Motors

Barker.....Barker Factory, Norwalk, Conn.
1¼, 2½, 4, 6½, 8 H. P. 1-2 cyls.

Bud-E.....The Carlyle Johnson Machine Co., 52 Main St., Manchester, Conn. 5 H. P. 2 cyls.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, N. Y.
3, 4, 6, 8 H. P. 2-4 cyls.

Caille.....Caille Perfection Motor Co., Detroit, Mich.
2½, 4, 6, 8, 14, 20, 30 H. P. 1-4 cyls.

Evinrude.....Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
2, 4 H. P. 1-2 cyls.

Gray.....Gray Motor Co., 2108 Mack Ave., Detroit, Mich.
4, 8 H. P. 1-2 cyls.

L-A.....Lockwood Ash Motor Co., Jackson, Mich.
2½, 4, 6, 8 H. P. 1-2 cyls.

Palmer.....Palmer Bros., Engines, Inc., Cos Cob, Conn.
2½, 4, 5, 6, 7½, 10 H. P. 1-2 cyls.

Pierce-Budd.....Pierce Motor Co., Bay City, Mich.
6, 15, 25, 40, 60 H. P. 1-6 cyls.

Waterman.....Arrow Motor & Mach. Co., 307 Market St., Newark, N.J.
2½, 3, 6 H. P. 1-2 cyls.

Outboard Motor Manufacturers

Elto.....Elto Outboard Motor Co., Milwaukee, Wis.
3 H. P. 2 cyls.

Evinrude.....Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Johnson.....Johnson Motor Co., South Bend, Ind.
2 H. P. 2 cyls.

L-A.....Lockwood-Ash Motor Co., Jackson, Mich.
2 H. P. 1 cyl.

Spinaway.....Spinaway Boat Motor Co., Freeport, Ill.
2 H. P. 1 cyl.

Wisconsin.....Wisconsin Machinery & Mfg. Co., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Piston Displacement of Four-Cycle American Marine Motors

Motors Under 150 Cubic Inches

Piston Displacement	Motor	Rated H. P.	Bore & Stroke
24.74	Palmer	2	1-3 x3½
29.04	Regal	2	1-3¼x3½
43.30	Regal	4	1-3½x4½
44.18	Kermath	3	1-3¾x4
56.52	Buffalo	* 4	2-3x4
71.57	Palmer	3½	1-4½x4½
87.47	Regal	5	1-4½x5½
87.88	Universal	12	4-2½x4
88.36	Kermath	8	2-3¾x4
88.60	Frisbie	5	1-4¾x5
95.04	Red Wing	14	4-2¾x4
99.43	Palmer	4½	1-4½x6
96.22	Buffalo	* 6	2-3½x5
98.92	Sterling	10	4-2¾x4½
99.40	Gray	*12	2-3¼x6½
113.10	Regal	8	2-4 x4½
117.81	Palmer	6	1-5 x6
117.81	Peerless	6	1-5 x6
127.24	Palmer	16	4-3 x4½
127.24	Trojan	15	4-3 x4½
136.14	Palmer	6½	1-5½x6
142.55	Wolverine	7	1-5½x6
143.14	Palmer	7	2-4½x4½
149.32	Fay & Bowen	17	4-3¼x4½

Motors from 150 to 300 Cubic Inches

153.92	Kermath	12	4-3⅛x4
153.92	Caille	14	4-3⅛x4
153.92	Scripps	*20	4-3⅛x4
154.43	Regal	7	1-5¼x6½
165.92	Wisconsin	18	4-3¼x5
169.65	Frisbie	7	1-6 x6
170.24	Scripps	18	2-4½x6
173.20	Red Wing	20	4-3½x4½
174.94	Regal	10	2-4½x5½
176.72	Cady of Canastota	16	4-3¾x4
176.72	Kermath	18	4-3¾x4
176.72	N. J. M.	15	4-3¾x4
176.72	Sturdy	15	4-3¾x4
177.20	Frisbie	10	2-4¾x5
190.86	Palmer	11	2-4½x6
192.44	Fay & Bowen	*22	4-3½x5
192.44	Gray	25	4-3½x5
194.92	Niagara	12	2-4¾x5½
198.80	L-A	14	4-3⅝x4½
198.80	Gray	*24	4-3⅝x4½
201.08	Kermath	25	4-4 x4
209.84	Red Wing	24	4-3¾x4¾
214.71	Palmer	10	3-4½x4½
220.88	Buffalo	20	4-3¾x5
220.88	Wisconsin	22	4-3¾x5
226.20	Speedway	28	4-4x4½
232.28	Regal	*	1-6½x7
235.62	Palmer	12	2-5 x6
235.62	Peerless	12	2-5 x6
243.00	Capitol	*25	4-3¼x5½
243.00	Sterling	*25	4-3¾x5½
251.31	Wisconsin	24	4-4 x5

Motors from 150 to 300 Cubic Inches

251.32	Brennan	20	4-4x 5
255.26	Buffalo	12	2-5 x6½
255.26	Standard	12	2-5 x6½
259.40	Red Wing	36	4-4 1-16x5
263.88	Fay & Bowen	*28	4-4 x5¼
265.80	Frisbie	18	3-4¾x5
276.48	Standard	*25	4-4 x5½
281.42	Regal	14	2-5¼x6½
283.52	Kermath	*16	4-4¾x4
283.72	Wisconsin	30	4-4¼x5
286.29	Palmer	15	3-4½x6

Motors from 300 to 500 Cubic Inches

301.60	Peerless	20	4-4 x6
301.60	Gray	35	4-4 x6
312.12	Capitol	60	4-4¼x5½
318.08	Red Wing	40	4-4½x5
330.72	Sterling	*35	4-4¾x5½
332.62	Sterling	15	2-5½x7
340.30	Frisbie	16	2-6 x6
340.48	Stearns	45	4-4¼x6
340.48	Scripps	50	4-4¼x6
349.88	Regal	20	4-4½x5½
349.88	Fay & Bowen	40	4-4½x5½
349.88	Speedway	44	4-4½x5½
353.43	Palmer	18	3-5 x6
354.40	Buffalo	30	4-4¾x5
354.40	Frisbie	30	4-4¾x5
363.56	Peerless	24	2-5¾x7
381.72	Palmer	20	4-4½x6
381.72	Stearns	65	4-4½x6
389.84	Niagara	35	4-4¾x5½
389.84	Fay & Bowen	40	4-4¾x5½
389.84	Wisconsin	40	4-4¾x5½
392.72	Brennan	40	4-5 x5
397.60	Kermath	40	4-4½x6¼
424.12	Buffalo	15	2-6 x7½
425.28	Gray	45	4-4¼x6
425.28	Wisconsin	42	6-4¼x5
449.46	Wisconsin	46	4-5.1x5¼
452.40	Standard	18	2-6 x8
464.56	Wolverine	14	2-6½x7
471.24	Palmer	24	4-5 x6
471.24	Peerless	35	4-5 x6
477.12	Brennan	40	6-4½x5
490.88	Fay & Bowen	45	4-5 x6¼
497.76	Regal	18	2-6½x7½

Motors from 500 to 700 Cubic Inches

508.95	Frisbie	25	3-6 x6
510.52	Buffalo	24	4-5 x6½
510.52	Standard	24	4-5 x6½
510.72	Palmer	18	2-6¾x8
510.72	Scripps	45	6-4¼x6
524.82	Speedway	66	6-4½x5¼
524.82	Regal	32	6-4½x5¼
524.82	Fay & Bowen	50	6-4½x5½
536.36	Stearns	90	4-5¼x6½

Motors from 500 to 700 Cubic Inches

549.80	Hall-Scott	125	4-5 x7
549.80	Peerless	125	4-5 x7
554.12	Twentieth Century	20	2-6¼x8½
570.20	Brennan	60	4-5½x6
582.72	Elco	65	4-5 9/16x6
584.76	Wisconsin	55	6-4¾x5½
606.12	Wisconsin	54	4-5¼x7
617.72	Regal	30	4-5¼x6½
621.00	Sterling	150	6-4 11/16x6
641.48	Sterling	55	4-5¼x6¾
665.24	Wolverine	40	4-5½x7
665.24	Wisconsin	57	4-5½x7
665.24	Buffalo	60	4-5½x7
674.22	Wisconsin	65	6-5.1x5½
678.60	Standard	27	3-6 x8
678.60	Frisbie	40	4-6 x8
678.60	Brennan	80	4-6 x6
692.72	Buffalo	22	2-7 x9
696.84	Wolverine	22	3-6½x7

Motors from 700 to 1000 Cubic Inches

701.04	Sterling	150	4-5¼x6¾
727.12	Wisconsin	62	4-5¾x7
727.12	Speedway	75	4-5¾x7
727.12	Peerless	50	4-5¾x7
736.32	Fay & Bowen	65	6-5 x6¼
766.08	Palmer	26	3-6½x8
824.70	Hall-Scott	200	6-5 x7
824.70	Peerless	250	4-5 x7
848.24	Buffalo	30	4-6x 7½
859.04	Niagara	80	4-6¼x7
874.08	Elco	100	6-5 9/16x6
883.56	Palmer	25	2-7½x1
904.80	Standard	37	4-6 x8
909.18	Wisconsin	80	6-5¼x7
962.22	Sterling	125	6-5¼x6¾
995.52	Regal	36	4-6½x7½
997.86	Wisconsin	85	6-5½x7

Motors from 1000 to 1500 Cubic Inches

1017.90	Frisbie	75	6-6 x6
1021.44	Palmer	35	4-6½x8
1056.68	Sterling	225	6-5¾x6¾
1061.84	Standard	60	4-6¼x8
1090.68	Wisconsin	90	6-5¾x7
1090.68	Speedway	150	6-5¾x7
1099.60	Hall-Scott	300	8-5 x7
1099.60	Peerless	450	8-5 x7
1128.24	Twentieth Century	50	4-6½x8½
1192.80	Wolverine	32	3-7½x9
1288.24	Buffalo	80	4-6¾x9
1325.24	Palmer	35	3-7½x10
1357.20	Standard	54	6-6 x8
1365.44	Buffalo	45	4-7 x9
1402.08	Sterling	300	8-5¾x6¾
1454.24	Speedway	200	8-5¾x7

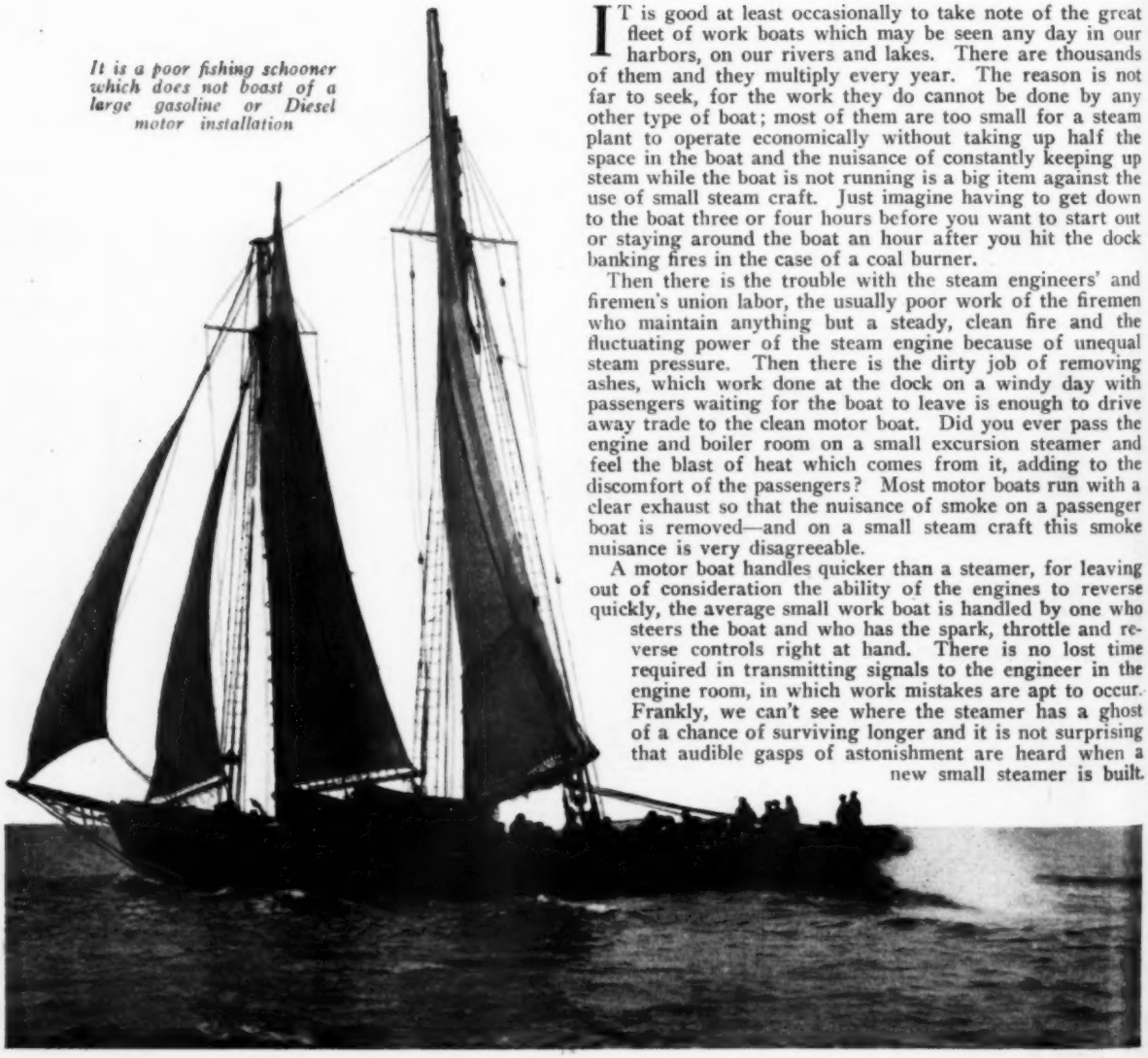
* Discontinued sizes.

Marine Engines to Aid the Workers

Our Great Fleet of Interesting Commercial Motor Boats Engaged in Many Useful Occupations

New York is now only a short distance from the deep sea fishing banks, thanks to the marine engine

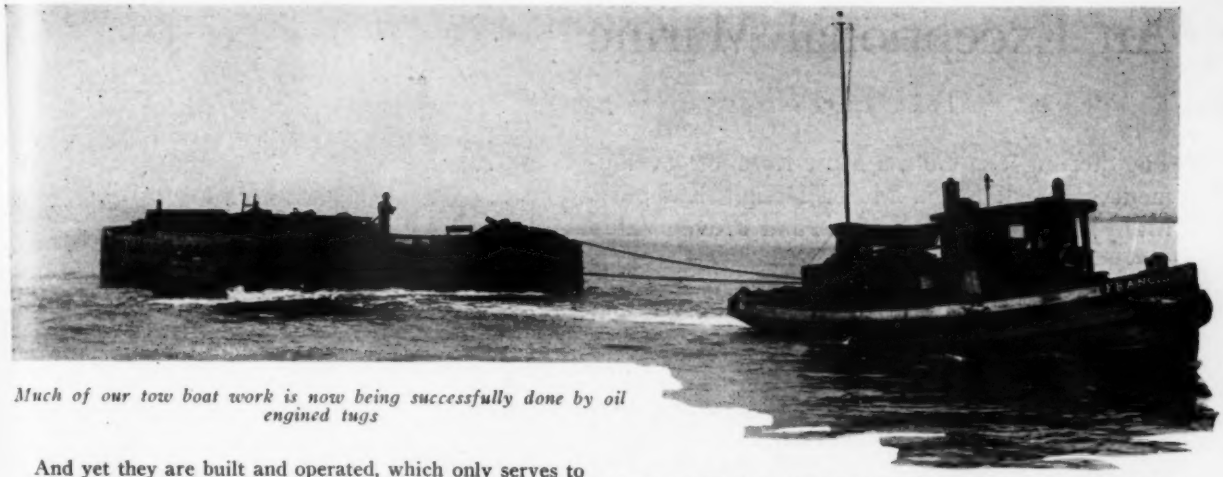
It is a poor fishing schooner which does not boast of a large gasoline or Diesel motor installation



IT is good at least occasionally to take note of the great fleet of work boats which may be seen any day in our harbors, on our rivers and lakes. There are thousands of them and they multiply every year. The reason is not far to seek, for the work they do cannot be done by any other type of boat; most of them are too small for a steam plant to operate economically without taking up half the space in the boat and the nuisance of constantly keeping up steam while the boat is not running is a big item against the use of small steam craft. Just imagine having to get down to the boat three or four hours before you want to start out or staying around the boat an hour after you hit the dock banking fires in the case of a coal burner.

Then there is the trouble with the steam engineers' and firemen's union labor, the usually poor work of the firemen who maintain anything but a steady, clean fire and the fluctuating power of the steam engine because of unequal steam pressure. Then there is the dirty job of removing ashes, which work done at the dock on a windy day with passengers waiting for the boat to leave is enough to drive away trade to the clean motor boat. Did you ever pass the engine and boiler room on a small excursion steamer and feel the blast of heat which comes from it, adding to the discomfort of the passengers? Most motor boats run with a clear exhaust so that the nuisance of smoke on a passenger boat is removed—and on a small steam craft this smoke nuisance is very disagreeable.

A motor boat handles quicker than a steamer, for leaving out of consideration the ability of the engines to reverse quickly, the average small work boat is handled by one who steers the boat and who has the spark, throttle and reverse controls right at hand. There is no lost time required in transmitting signals to the engineer in the engine room, in which work mistakes are apt to occur. Frankly, we can't see where the steamer has a ghost of a chance of surviving longer and it is not surprising that audible gasps of astonishment are heard when a new small steamer is built.

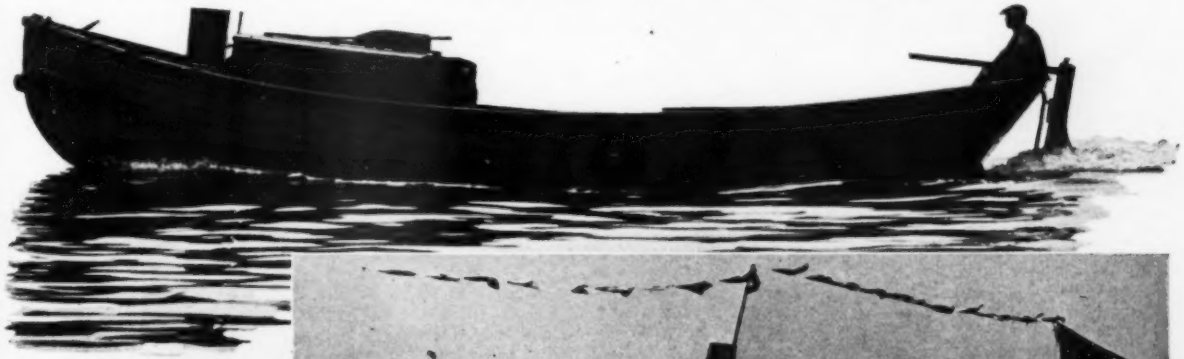


Much of our tow boat work is now being successfully done by oil engined tugs

And yet they are built and operated, which only serves to prove that it is up to us in the business of producing internal combustion engines of all kinds, motor boats and their equipment to stand together and thoroughly saturate the country with propaganda favoring our product. For in many lines of marine activity they still stick to steam; in the tow boat business perhaps more than in any other the steam plant is more solidly rooted than in any other. Here and there on the Atlantic Coast motor tugs have performed with the utmost reliability and economy, making records which are staggering when compared with those of the steam tugs they compete with—and yet tug boat owners as a class stick to steam. The pioneers in operating motor tugs have often beaten these steam tugs right in the same harbor on the same work, at the same time and yet many of the tug boat owners continue to say of the motor tug, "There ain't no such animal." In one case which we remember a steam tug and a motor tug were lying at the same dock when they received orders to proceed on certain work up the harbor. In a few minutes the motor tug was on her way, while the fires of the steam tug were banked and by the time she arrived on the job the motor tug had been working one hour and a half, as it required three hours to get up steam. The steam tug was so late that she lost the contract—and contracts were scarce then. Another feature about motor work boats is that they don't need smoke stacks and can therefore pass under bridges that the steam tug cannot. Many hours are thus saved in a week's work.

For freight service one of the great advantages of motor boats is the saving in weight over that of a steamer, the heavy boiler with its water content and the extra fuel which must be carried bring the weight per horsepower to about 600 lbs., on an average, while in a gasoline, kerosene or distillate engine it is about 200 lbs., and with a Diesel or semi-Diesel it is about 300 lbs. per h.p. The average gasoline, kerosene or distillate engine occupies about one-quarter of the space occupied by a steam plant, while the Diesel and semi-Diesel engine occupies more space than these other internal combustion engines, but operates on cheaper fuel oil. Where this weight- and space-saving feature is particularly valuable is in a shoal draft freight boat and this is a type that should be more highly developed in this country. Every inch of draft counts on boats for use in many parts of the country; a saving in weight of machinery can be made to reduce the displacement and consequent draft by that amount. On our great network of rivers there is a tremendous field little developed as yet for shoal draft work boats for carrying all the miscellaneous products of the

(*Continued on page* 132)

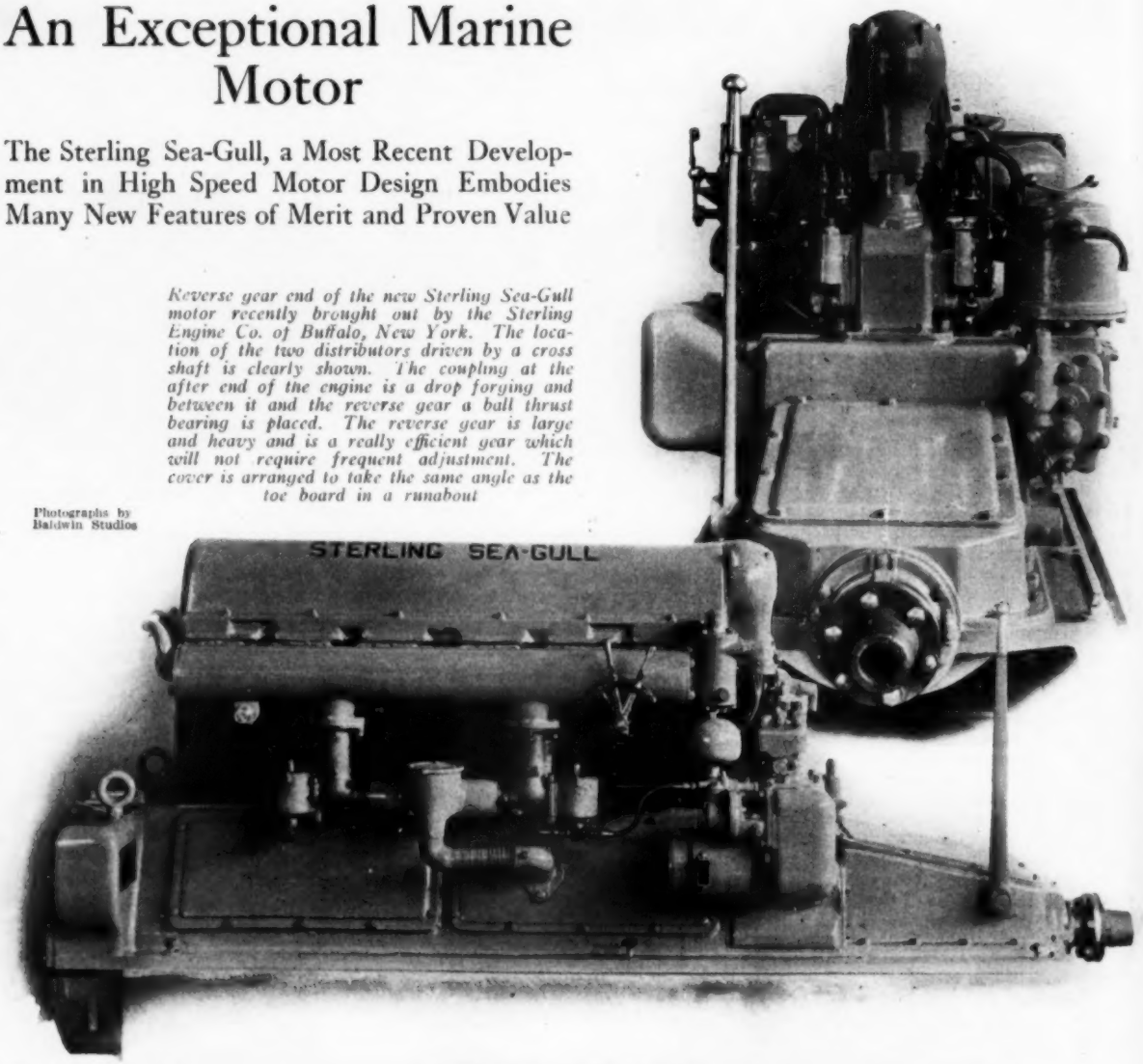


The dory fisherman has it easier when he does not have to row a heavy boat

Small gasoline or oil engine excursion craft can carry agreeable parties at less expense than the large steamers can

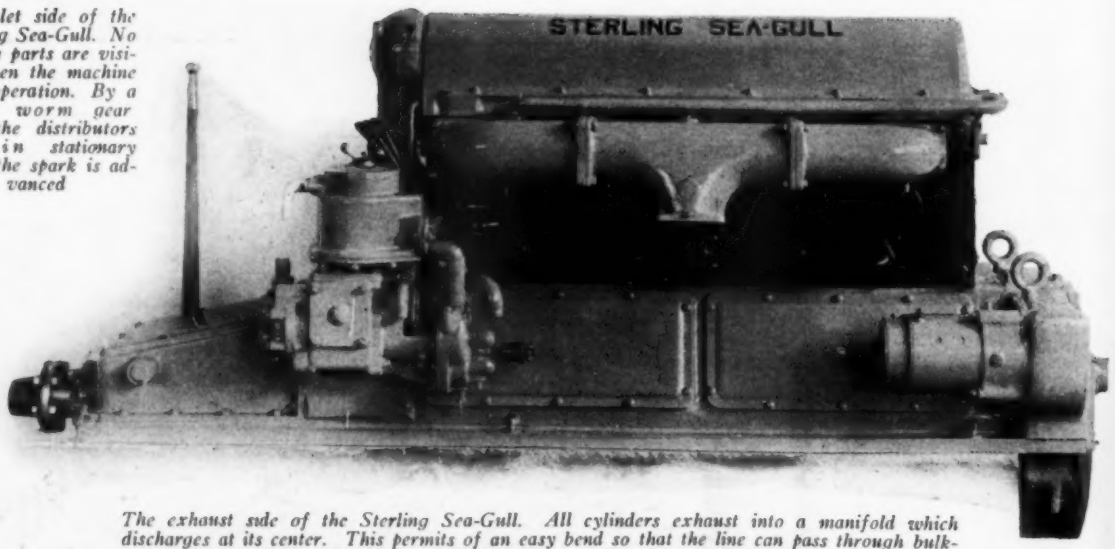
An Exceptional Marine Motor

The Sterling Sea-Gull, a Most Recent Development in High Speed Motor Design Embodies Many New Features of Merit and Proven Value



Reverse gear end of the new Sterling Sea-Gull motor recently brought out by the Sterling Engine Co. of Buffalo, New York. The location of the two distributors driven by a cross shaft is clearly shown. The coupling at the after end of the engine is a drop forging and between it and the reverse gear a ball thrust bearing is placed. The reverse gear is large and heavy and is a really efficient gear which will not require frequent adjustment. The cover is arranged to take the same angle as the toe board in a runabout

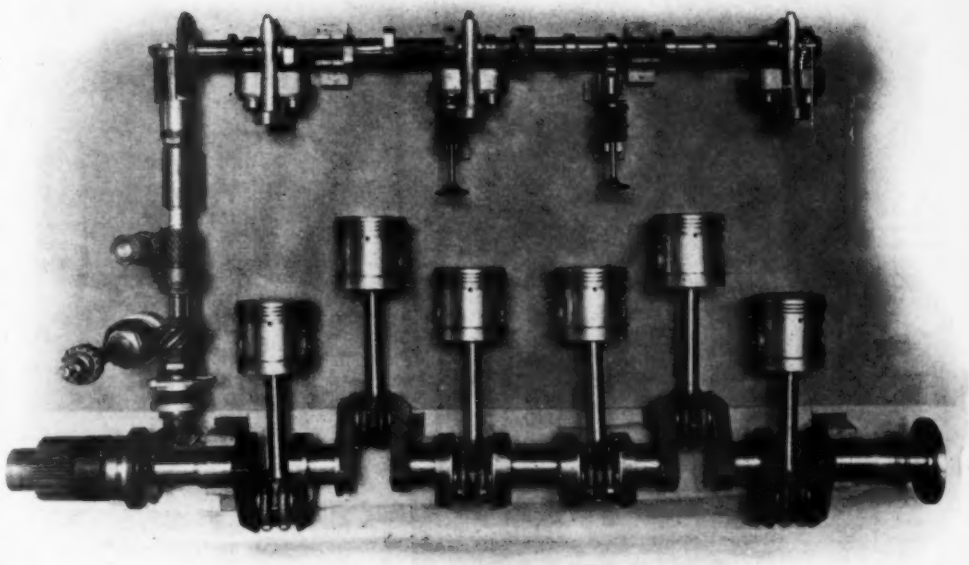
Photographs by Baldwin Studios

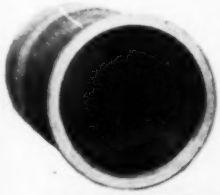


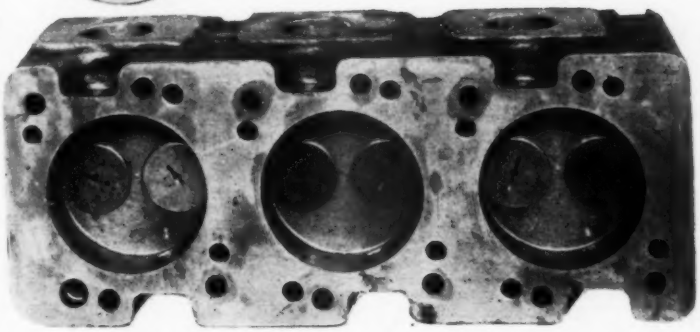
The inlet side of the Sterling Sea-Gull. No moving parts are visible when the machine is in operation. By a special worm gear even the distributors remain stationary while the spark is advanced

The exhaust side of the Sterling Sea-Gull. All cylinders exhaust into a manifold which discharges at its center. This permits of an easy bend so that the line can pass through bulkheads with a minimum interference. The design provides for a sufficient water discharge into the exhaust line for cooling and silencing without requiring additional piping

The complete operating mechanism of the Sterling Sea - Gull. Four pairs of silent spiral bevel gears are used to drive the overhead camshaft, pumps, generators, etc. The camshaft is forged and bored for lightness, also to conduct oil to the bearings. The bearings on the crankshaft are 2⅝-inches in diameter and seven in number

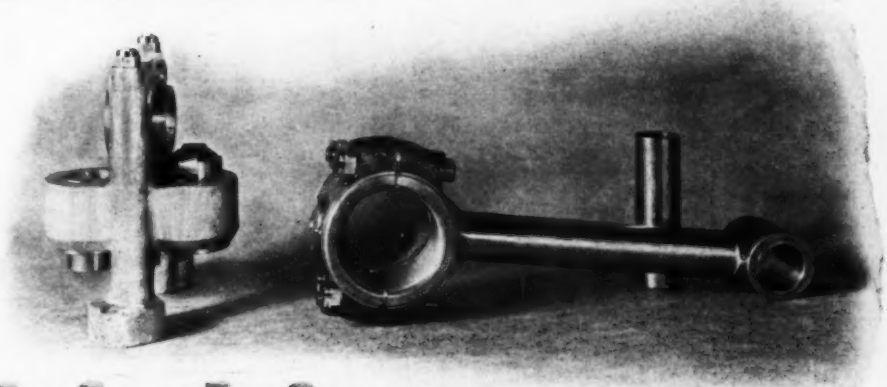


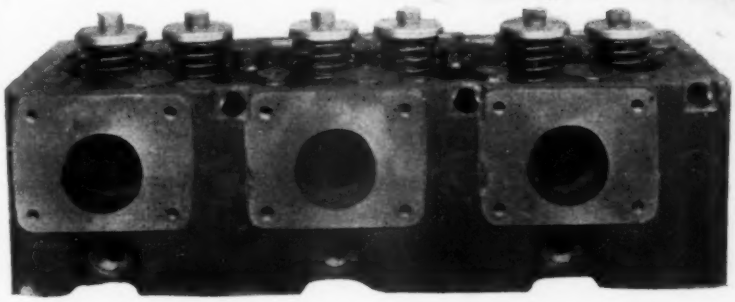




Inside cylinder head of the Sterling Sea-Gull motor. Large valves and water cooled seats are a distinguishing feature. Ample gasket space eliminates leakage when operating for long periods at high ratings. From a structural standpoint the long base castings amply supported shows the engine to be remarkably rigid. It will not be affected by the weaving of a light hull at high speed

Connecting rod of the Sterling Sea-Gull. This is made from a solid forging of special alloy steel and weighs only five pounds. Its hollow section permits lubrication to the piston pin and affords a structure of great strength. The camshaft bearing supports the cams for valve operation in such a way that there is very little movement to the push rod with long wear and long life

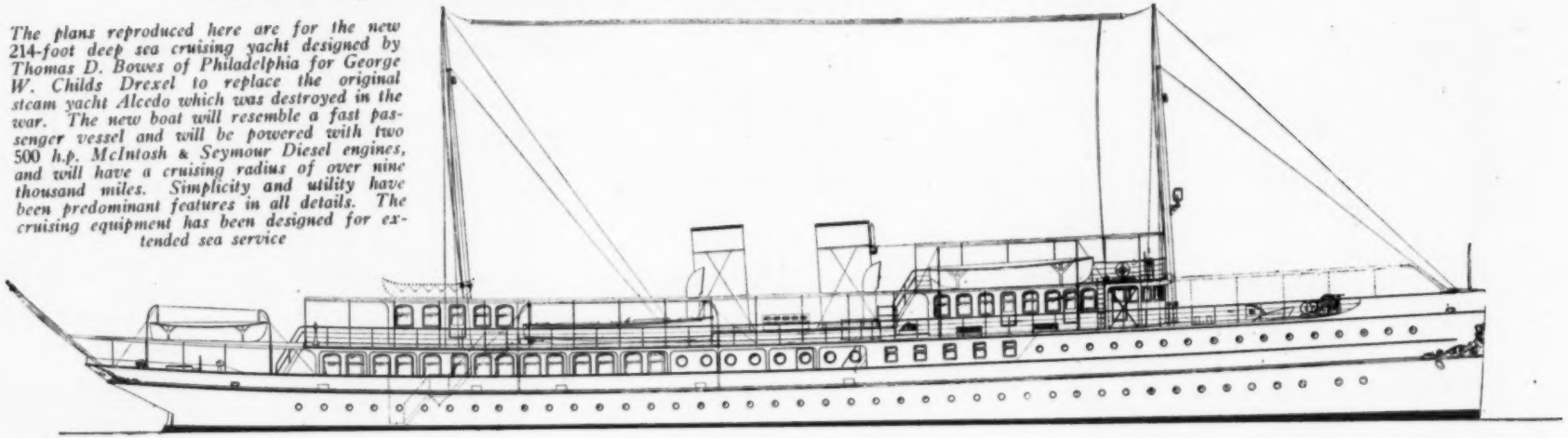


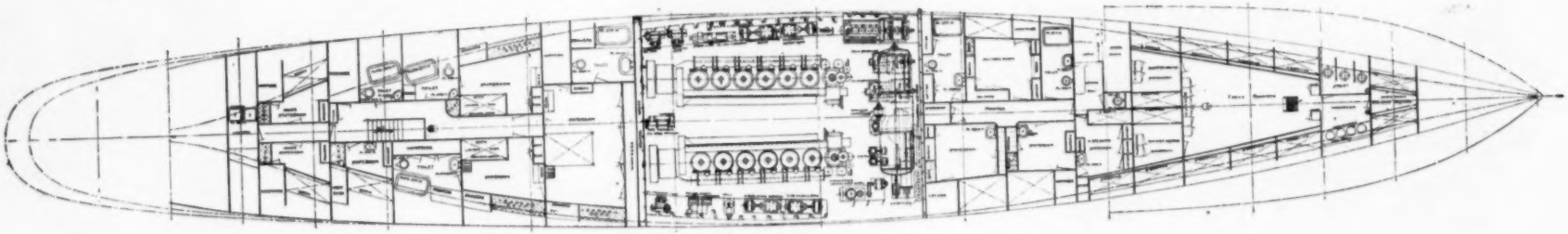


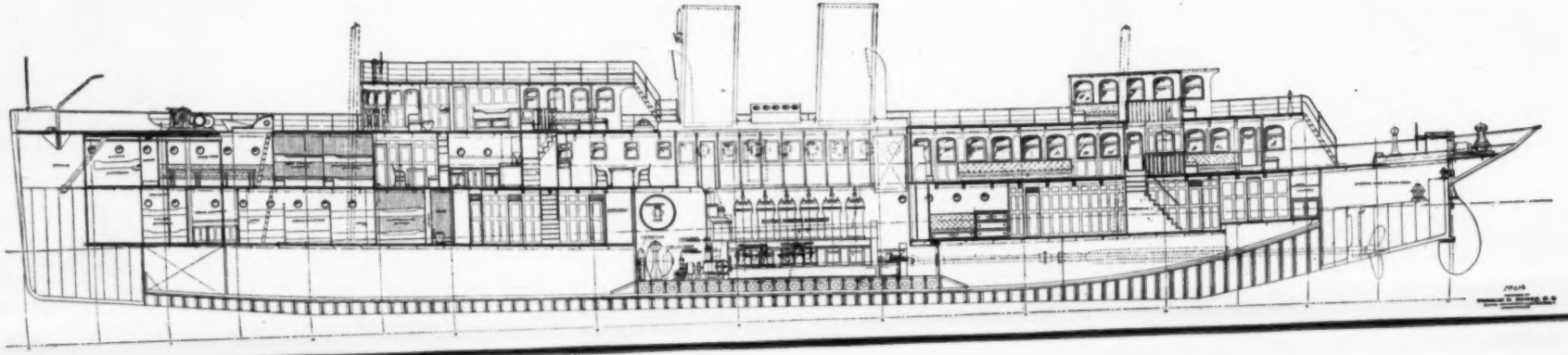
Cylinder head casting cannot warp and valve seats are completely water cooled. Valve springs are double with different tensions on the inner one. Motors are built with compression ratios to suit runabouts and cruisers for operation at 800 to 2,500 revolutions according to the type of boat. Maximum power for piston displacement is produced

Alcedo, a Notable Diesel Engine Equipped Yacht

The plans reproduced here are for the new 214-foot deep sea cruising yacht designed by Thomas D. Bowes of Philadelphia for George W. Childs Drexel to replace the original steam yacht Alcedo which was destroyed in the war. The new boat will resemble a fast passenger vessel and will be powered with two 500 h.p. McIntosh & Seymour Diesel engines, and will have a cruising radius of over nine thousand miles. Simplicity and utility have been predominant features in all details. The cruising equipment has been designed for extended sea service







Glorious Racing Season Everywhere

Aquatic Activities in the East and West Surpass Other Seasons' Events

Motorboats to Compete for Pacific Coast Gold Trophy

WHEN entries closed recently for the Cecil B. de Mille gold cup race to be held September 10, six speedboats were listed, and it is believed that at least one additional owner got his blank and fifty dollar check in the mail in ample time. This means that there will be at least six, and probably seven, fast power craft in the season's classic off the Los Angeles Harbor.

As the list now stands it includes Ralph Hamlin's Joker II, Fred. W. Vogler's (Portland) new Vogler Boy, A. L. Fleming's Lincoln, Dustin Farnum's Miss Los Angeles II, William W. Paden's mile-a-minute Hurricane II and Frank A. and Frank E. Garbutt's Mystery. Even should the mail disgorge no others, this will be the largest and swiftest array of contenders ever lined up for a trophy on the Pacific Coast.

Special interest centers in the three new speedsters entered, Joker II, Lincoln and Vogler Boy. The latter has demonstrated championship class in northern water this season, while the other two have undergone no thorough trials, but give great promise. The Mystery, too, is an unknown quantity, because of the jinx that has persistently spoiled her chances in all the events since her first appearance, but enough is known of this beautiful craft's capacity to make it certain that she can show her heels to some of the best. This boat and Lincoln are approximately the same size, but Mystery has more power. Hurricane II is decidedly a known quantity since she won the mile speed trials at Los Angeles Harbor and took the honors at San Francisco.

This annual free-for-all ninety-nine-mile race under the auspices of the Los Angeles Athletic Club Motorboat Racing Association and the California Yacht Club, for a beautiful trophy worth $1,000, is expected to become a national event in a year or two. Some of the fastest boats in the East are sure to compete for it next season.

Yachtsmen's Association of America

ENGLAND and Canada will participate in the International Motor Boat Racing Conference, to be held in Detroit, during the Gold Cup Regatta, by the newly organized Yachtsmen's Association of America. It was originally planned to hold the conference on Tuesday, September 5, the day after the Gold Cup Regatta. At a conference of officers of the Y. A. A. last week it was decided that the conference would be held at 10 a.m. Labor Day, Monday, September 4, at the Detroit Yacht Club.

Commodore Garfield A. Wood, president of the Y. A. A., will preside. The Royal Motor Yacht Club of Southampton, Eng., one of the three governing bodies for the British International (Harmsworth) Trophy, has announced that its representative will be C. E. Nicholson. Canada will be represented by Col. Thos. A. Duff, of Toronto, and Commodore George H. Godderham, of St. Catherines. Invitations extended to France, Italy and other European countries have not yet been accepted. Mr. Nicholson, the British representative, is not unknown to American Yachtsmen, as he designed the last Shamrock sent over by Sir Thomas Lipton. It is evident that he is interested in designing a speed boat for the B. I. T. event or he would not represent the Royal Motor Yacht Club.

Advices from England indicate that Mr. Nicholson will propose a minimum length of 30 feet for all hydroplanes competing for the Harmsworth trophy, with a maximum piston displacement of the engine or engines of 1,700 cubic inches. Heretofore and under the present deed of gift the race is limited to craft of 40 feet or under and no limitation put on the power plants.

Under the proposal of the Royal Motor Yacht Club, as outlined in the communication, the hydroplanes, with which Commodore Gar Wood has twice triumphed in the International championship, would be ineligible, as Miss America I, 1920, has two Liberty engines and Miss America II, 1921, has four Liberty engines for power plant.

The English proposal would limit the eligible boats to not more than one engine of the Liberty size, the crafts being similar to the Miss Chicago, Miss Toronto II and Baby Sure Cure, but longer hulls.

Communications recently received in this country from Samuel E. Saunders, the Cowes boat designer and builder who created all of the Maple Leafs for Sir Mackay Edgar, does not favor restricting the B. I. T. boats, but suggests that in addition to racing for the International honors in the Harmsworth that there be created two or three classes for runabouts for international competition.

Several weeks ago Commodore R. Morton Smart, of the British Motor Boat Club, communicated with the Americans interested in international races regarding such a conference, stating that the European bodies interested were shortly to hold an informal conference in London. It is evident that Mr. Nicholson will bring to America the suggestions made at this meeting.

Canada is interested in the conference as the Royal Motor Yacht Club has made a place on its team for the 1923 race for the Harmsworth for Canada. In permitting the Dominion to enter one of the three crafts to represent the British Empire the Royal Motor Yacht Club agrees that in the event Canada should win the trophy in 1923 that the Dominion craft can defend the championship honors in Canadian waters in 1924, but stipulates that the agreement does not exist after the 1924 race.

Cresceus Wins Scripps Trophy

COMMODORE ALEX. I. McLEOD, Detroit Yacht Club, won the fourth annual race for the Commodore William E. Scripps Reliability Trophy, staged by the Cleveland Yacht Club, July 29. The race is for cabin cruisers of a maximum speed of 14 miles an hour, with the cruisers handicapped on measurement and engine speeds, with an observer aboard to take engine readings every half hour. The distance is 110 miles and the race is sailed at night, it being the idea of Commodore Scripps to make the race a navigation test. The course measures 110 miles from Rocky River to Put-in-Bay and return.

Commodore McLeod's Cresceus won the race easily, distancing the runner-up by almost three-quarters of an hour. The next nine boats to finish all came in within three-quarters of an hour. The winner was presented with a silver shield and $300 in cash, a total of $1,000 being divided among the first 10 boats. The trophy will be retained by the Detroit Yacht Club until July 1, 1923. This was the first race of the series under the direction of the Cleveland Yacht Club when the night was clear and the skippers did not encounter any squalls. The limit boat started at 6:41:12 and the scratch boat at 10:00:32. A total of 25 cruisers from various Lake Erie ports entered, but only 16 reported for the race.

The summary:—

Boat, Owner and Club	Finish time	Elapsed time	M.P.H.
Cresceus, A. I. McLeod, D. Y. C.	7:42:30	11:08:52	9.8
Kekoose, H. S. Thomas, C. Y. C.	8:14:08	11:36:04	9.7
Tobermory, R. Kinney, C. Y. C.	8:19:45	12:44:36	8.6
Northstar, S. Szabo, C. Y. C.	8:22:17	10:38:10	10.4
Gloria, F. Ellsworth, D. Y. C.	8:27:25	10:51:00	10.1
Tillamook, Geo. Jerome, D. Y. C.	8:40:52	11:01:39	9.9
Poppy, A. G. Smith, PIB. Y. C.	8:45:22	10:44:50	10.2
Winifred, R. L. Bacher, C. Y. C.	8:48:50	12:15:30	8.9
Argus, H. A. Parsons, C. Y. C.	8:54:52	12:21:38	8.8
Babo, Kent North, C. Y. C.	8.57:50	11:40:52	9.3
Althea, Grant Duff, W. B. C.	9:22:40	13:28:48	8.2
Bat II, R. C. Durand, R. R. Y. C.	10:20:21	13:59:31	7.8
Keewaydin, Langdon & Griffith, E. B. C.	10:30:50	14:16:54	7.7
Louise, C. Ennis, C. Y. C.	10:42:45	13:33:13	8.1
Edna II, P. J. Shomer, C. Y. C.	12:12:15	17:31:03	6.3
Thira Audrey, H. B. Wallace, V. B. C.	4:10:00	19:26:22	5.6

Unusual Speedboat Race on Pacific Coast

THE California Yacht Club and the Los Angeles Athletic Motorboat Racing Association are announcing a new annual speed event, which really consists of two races in one, for the last Sunday in September. This year the date is set for September 24. The entries close August 1 each year. The prizes are out of the ordinary, many boats are eligible, and a large list of contenders is anticipated.

Two classes, step boats and boats without, will participate, both starting together. No restrictions of any kind. The winner of first place in each division will have the choice of a silver cup, design to be submitted, or a Hall-Scott motor and a gold shield; the second will get a silver shield, if there are three or more entries in each division, and the third a bronze shield, if there are four or more entries in each division. The course will be the same as that of the Fellows' Day race—sixty-six miles in four laps of sixteen and one-half miles each, starting at the L. A. A. C., outer Harbor Anchorage, thence around Point Firmin buoy to Long Beach, and return to starting point.

(*Continued on page* 102)

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

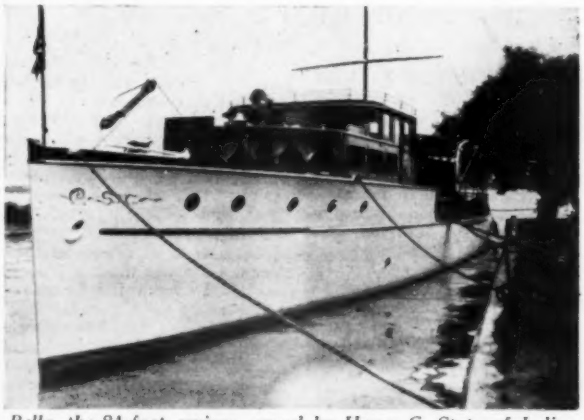
New Yacht Works in Miami

The long established boat and repair yard formerly known as the Miami Yacht and Machine Works, or by another name as Huffstettler's Boat Yard, has been acquired by a new company who will operate it on a more modern scale and program. This yard has been in business for fifteen odd years and is well known among yachtsmen who visit the south. Its equipment includes the largest marine railway in Miami, which can handle any size yacht. Complete facilities are available for building pleasure craft of any size and effecting rapid repairs to hulls or motors. There is an abundant supply of experienced help and the only naval architect in the South. The policy adopted under the new management is to turn out a high quality of work with guaranteed workmanship and charge prices which are moderate in comparison with the services rendered. The location of the yard at the mouth of the Miami River is such that it is not necessary to pass any bridges on the way to or from the harbor.

The Belle Isle Show Rooms

The finest permanent exhibition of small motor craft has been established by the Belle Isle Boat & Engine Company at its factory on Motor Boat Lane, at Detroit. A new stucco building with a floor space 80 by 42 feet has been erected to house an extensive display of Belle Isle boats, including everything from Davis Dinghys to Belle Isle Runabouts, and the famous Belle Isle Bearcat. A separate display of engines is provided for in an adjoining room which also takes care of the marine supplies.

Lumber warehouses and seasoning rooms with a capacity of six carloads of lumber are nearly completed and construction will shortly be started on a large new machine shop.



Bella, the 84-foot cruiser, owned by Harry C. Stutz of Indianapolis. This boat has been recently equipped with radio and it will be noted that the aerial wires are installed in an unique manner on a series of insulators around the top of the pilot house. Very satisfactory results are being obtained with this installation

The questions for Lesson No. 6 of the Dead Reckoning Course will be found on page 100 of this issue. Names of students who were successful in passing papers submitted during July will also be found on page 100.

Questions and Answers on Lessons Nos. 6 and 7 of the Seamanship and Piloting Course will be printed in October.

F. H. Anson, an 83-foot tow boat equipped with a six cylinder Winton Diesel engine of 300 h. p., operating near Montreal for the Abitibi Power and Paper Company. She was designed by Ralph E. Winslow of Atlantic, Mass., and replaces two steam boats. She is used to tow logs for pulp wood containing 3,500 cords, and the superior economy of this boat is proven

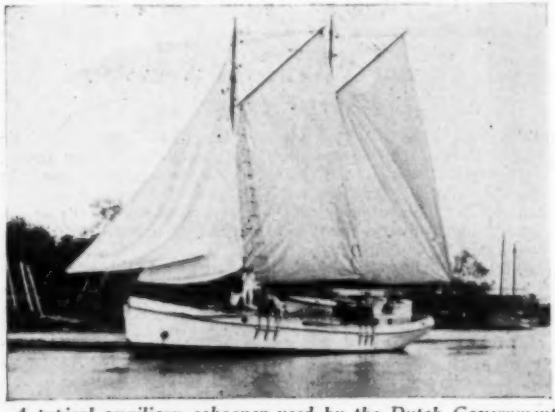
Navy Supplies for Boats

For some time we have been hearing of the wonderful sales that the Navy Department has been making and how the public were being given the opportunity of making big savings by buying standard navy supplies at unheard of prices. Until the present time it seemed that the only items sold that were ever heard of were blankets, shoes, and duffle bags. The E. J. Willis Co. of New York are now announcing that they have been successful in securing numerous items of motor boat equipment which are really useful and necessary for every yachtsman. For example, there are some solid copper binnacles with lamp and 4-inch compass and brass bulkhead lanterns complete with a separate light that are very acceptable for the porch, club, or camp and other items such as manilla rope, life preservers, fire extinguishers, and many other items too numerous to be mentioned.

A Sterling Performance

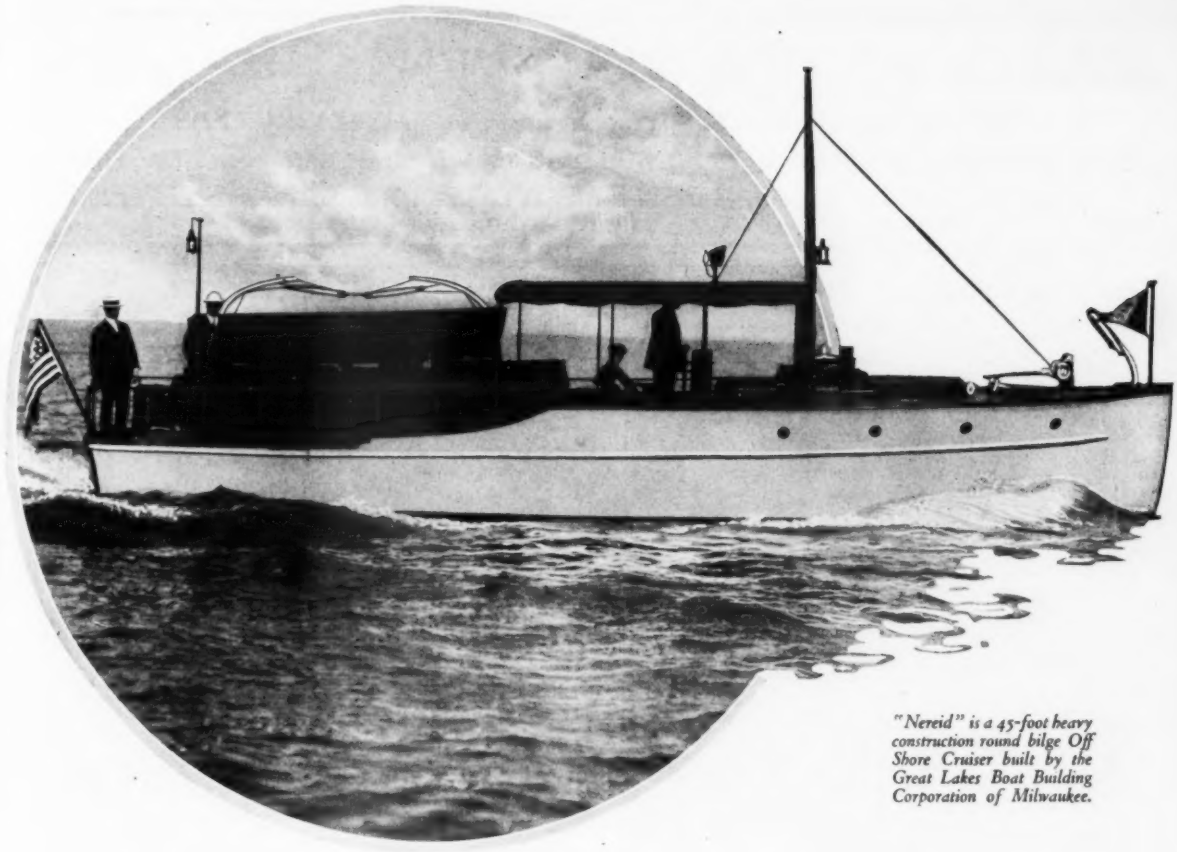
The fast hydroplane Fellows IV belonging to Joe Fellows at Catalina Island, Cal., is doing some very fast work these days. The boat is equipped with a six cylinder model GRS Sterling engine and has shown a speed of 42 or 43 real miles. The boat has participated in all of the

(*Continued on page* 61)



A typical auxiliary schooner used by the Dutch Government in the Dutch East Indies. Three of the vessels are in commission and all have been fitted with four cylinder Scripps gasoline motors for auxiliary power. They are 65 feet in length and 15 feet in beam

Interior view of the new motor boat show room of the Belle Isle Boat Building Company on Motor Boat Lane in Detroit The display is well lighted by large windows which permit it to be inspected from the street and at the same time afford ample daylight for the interior



"Nereid" is a 45-foot heavy construction round bilge Off Shore Cruiser built by the Great Lakes Boat Building Corporation of Milwaukee.

"Nereid"—Valsparred daughter of the sea

GRACEFUL as a sea nymph—this unusual little boat, the joint property of Messrs. S. C. Rosenbeek of Chicago and C. A. Cook of Milwaukee, is just starting out on the first leg of an 18 months' cruise which will churn a wake around half the North American continent.

Driven by a four-cylinder, heavy duty Sterling engine "Nereid" is capable of developing a speed of 14 miles an hour, and will prove her seaworthiness in many waters. After threading the Great Lakes, she will take the open sea down the east coast to Panama and thence to Los Angeles.

The natural finished joiner work on the "Nereid" is *Valsparred, of course!*

For the owners of "Nereid," like those of other pleasure craft of all types, know that Valspar is the varnish which is proof against water and weather, oils and gasoline, the varnish that won't turn white under any exposure or hard usage.

This coupon is worth 20 to 80 cents

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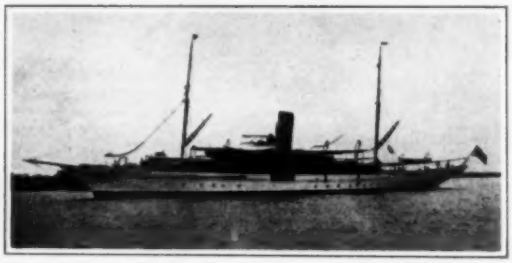
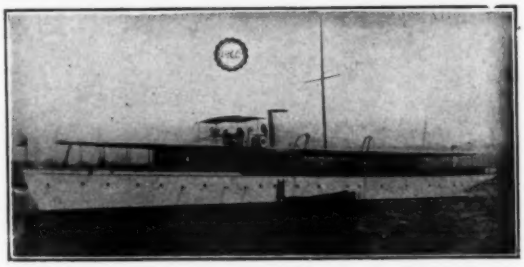
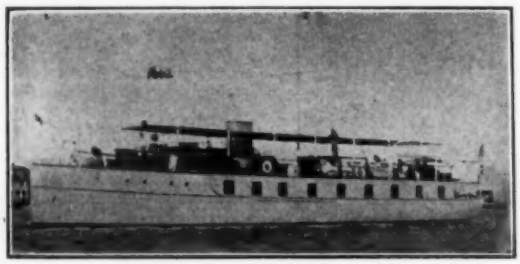
Complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



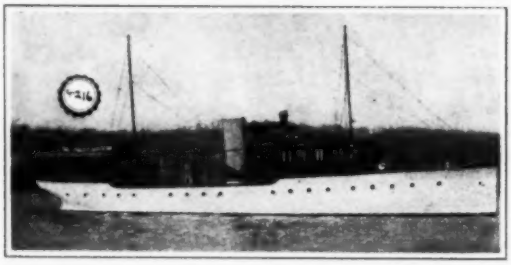
No. 341—For Sale or Charter—Large, sea-going steam yacht. Palatial accommodation. Unusual opportunity. Several similar and smaller available craft. Cox & Stevens, 25 Broadway, New York.



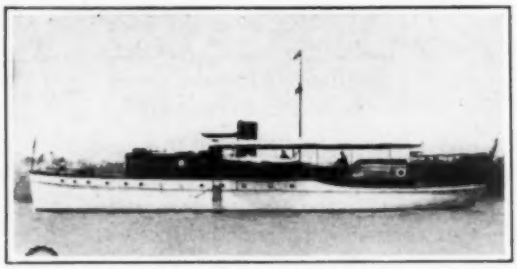
No. 1466—For Sale or Charter—Large and comfortable twin-screw steel cruising power yacht. Speed up to 17 miles. Dining saloon and social hall on deck; 3 double and 1 single staterooms, 3 bathrooms, etc. Handsomely fitted owner's quarters. Modern plumbing. Cox & Stevens, 25 Broadway, New York.



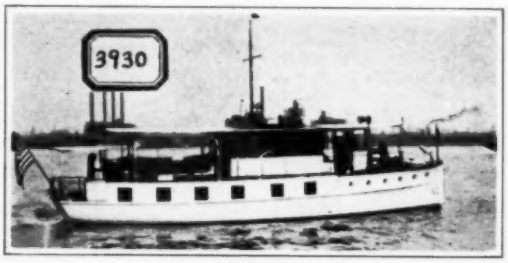
No. 1662—For Sale or Charter—Atfractive 90 ft. modern power houseboat. All the comforts of a country home. Large saloon, four staterooms, two bathrooms, handsomely furnished. Cox & Stevens, 25 Broadway, New York.



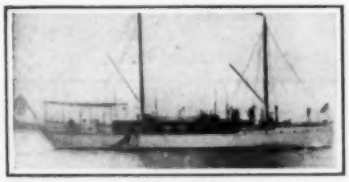
No. 4216—For Sale—In Commission—Modern 95 ft. twin screw motor yacht. Speed 12-14 miles. All conveniences. Deck dining and main saloons; four staterooms. Large deck space. Cox & Stevens, 25 Broadway, New York.



No. 2027—For Sale or Charter—Exceptionally roomy 90 ft. twin-screw power yacht. Speed 12 miles; 50-60 H.P. motors. Dining saloon in deckhouse forward, main saloon, two double and two single staterooms, bathroom and two toilets, etc. Large deck space. In commission. First-class condition. Cox & Stevens, 25 Broadway, New York.

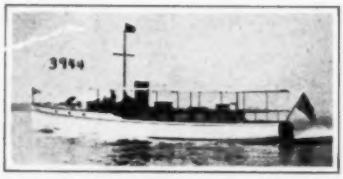


No. 3930—For Sale—Recently built motor houseboat; 61 x 16 x 3 ft. In commission. Speed 10 miles; 6 cyl. Standard motor. Large deck saloon, three staterooms, bathroom, etc. Excellent opportunity. Cox & Stevens, 25 Broadway, New York.



No. 353—Unusual bargain; 70 ft. cruising power yacht. Standard motor. Large saloon, double and single stateroom, bath and toilet room. Very able craft. In good condition. Price from Cox & Stevens, 25 Broadway, New York.

No. 4050—For Sale—High class fast 52 ft. twin-screw enclosed bridge deck cruiser. Speed up to 30 miles; two 8 cyl. 200 H.P. Speedway motors. Double stateroom, saloon with two pullman berths, toilet room, galley, etc. In commission. Cox & Stevens, 25 Broadway, New York.



No. 3944—For Sale or Charter—Practically new, twin screw 60 ft. bridge deck cruiser. Best craft of type and size available. Saloon, double stateroom, bathroom, etc. In Commission. Cox & Stevens, 25 Broadway, New York.

PLANS, PHOTOGRAPHS AND PRICES ON REQUEST.

Advertising Index will be found on page 146

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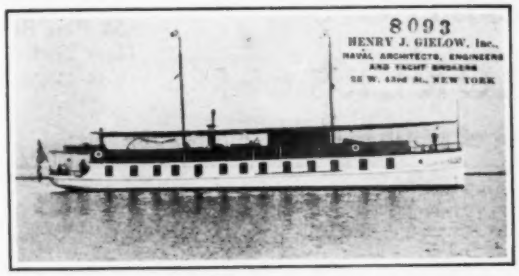
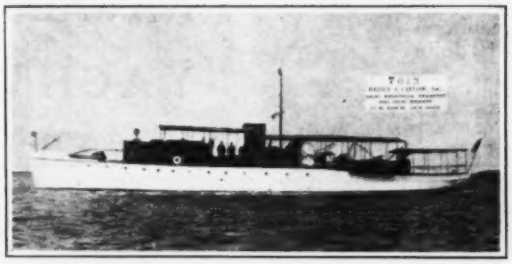
Plans and specifications for new yachts of any size or type should be prepared now to assure delivery for next year. Have plans of new yachts, all types, on file now.

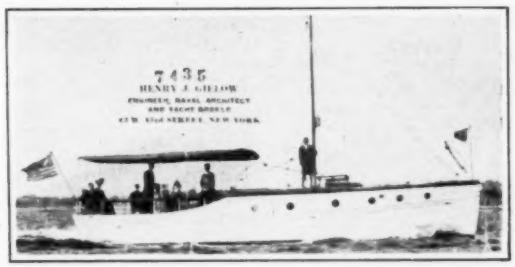
We have a most complete and up-to-date list of steam and motor yachts of all sizes, sail, auxiliary, and houseboats, on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat, upon request.



No. 8093—For Sale or Charter—Desirable 95 ft. twin screw power houseboat. Standard motors. Large saloon, three double staterooms, two bathrooms, and deck lounging saloon. Suitable for Northern and Southern cruising. Now in full commission. Henry J. Gielow, Inc., 25 West 43rd St., New York City.

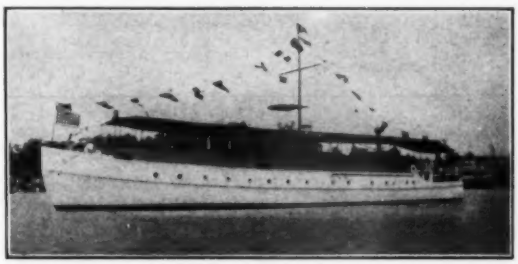


No. 7013.—For Sale—Opportunity to buy twin-screw Diesel motor yacht reasonable. Delivery Sept. 1. 110 x 18 x 6 ft. 6 in. Copper sheathed. 3 large, airy staterooms, each with separate toilet room, one bath. Completely found, electric fans and fully screened. Able sea boat, has twice cruised West Indies. Fuel cost sixty cents per hour at 10 knots. All overhauled 1922. H. J. Gielow, Inc., 25 West 43rd St., New York City.



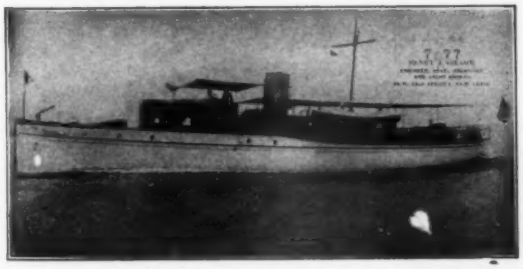
No. 7435—For Sale—Very attractive raised deck cruiser, 40 ft. x 10 ft. x 3 ft. 6 in. Speed 10 miles. 20th Century motor. Double stateroom, large saloon, galley, toilet room, etc. All in first class condition. Henry J. Gielow, Inc., 25 West 43rd St., New York City.

No. 7002—For Sale or Charter—Finest yacht of type available. 138 ft. twin-screw power yacht. Two 300 H.P. Standard engines. Dining room and social hall on deck; three double and one single staterooms; two bathrooms. All furnishings new 1920. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 8067—For Sale or Charter—Desirable twin-screw cruising houseboat suitable Florida and Northern waters. 88 ft. x 19 ft. x 3 ft. 6 in. 20th Century motors. Boat entirely overhauled and refitted 1920, three double and one single staterooms, saloon, deck saloon, sleep 8. Electric light and heating plants new 1920. Bath, two toilets. Has cruised Florida each year, good sea boat. Reasonable. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

No. 8177—For Sale—New houseboat cruiser completed spring delivery. 48 ft. x 13 ft. 6 in. x 3 ft. One double, one single staterooms, large saloon with two berths and deck saloon 12 ft. x 8 ft., sleeps six. Crew stateroom forward. Heavy construction, finished mahogany and cream enameled. Delco lighting plant. 40-50 H.P. 20th Century engine. All best workmanship. Speed 9-10 miles. Popular type for Florida and Northern cruising. Price reasonable based on present reduced building cost. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.



No. 7077—For Sale—Particularly desirable 80-foot twin-screw power yacht. "20th Century" 50-60 H.P. motors, new 1919. Deck dining room, two double staterooms, bathroom. All furnishings and equipment new 1919. Excellent condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

No. 8077—For Sale—Desirable cruising houseboat all in fine condition. Thoroughly overhauled 1921. Inspectable New York. 75 ft. x 16 ft. x 3 ft. 6 in. Winton motor, 6 cylinder 70 H.P. Three large staterooms, large deck saloon; newly furnished, screened throughout. Heavily built, able sea boat. Speed 10-11 miles. Price attractive. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

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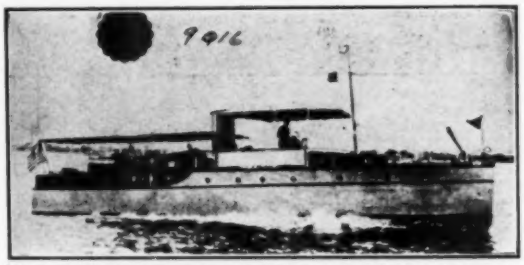
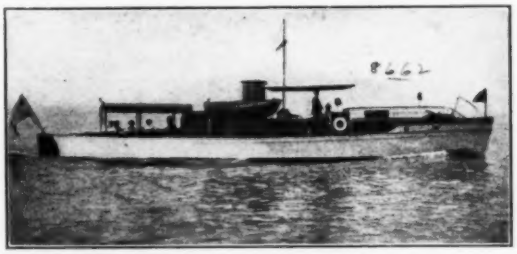
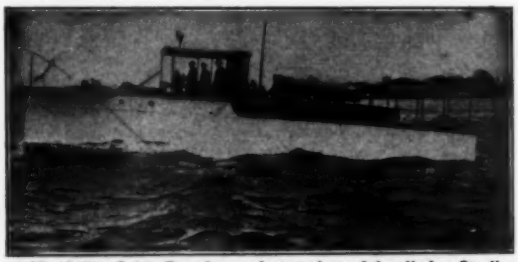


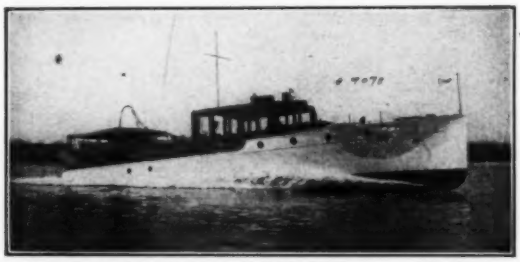
No. 9016—Sale—Charter—Desirable 60 ft. raised deck cruiser, thoroughly overhauled 1921. Two new 6 cylinder 90 H.P. Sterling motors.



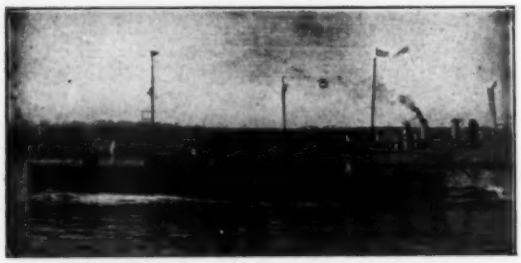
No. 8662—Price Reasonable. Twin Screw 60 ft. fast cruiser. 2 90 H.P. Sterling motors. Inspectable Maine waters.



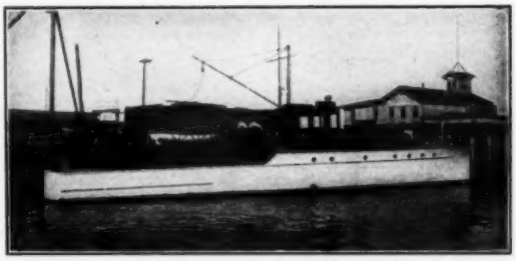
No. 7474—Sale—Brand new fast cruiser; 2-6 cylinder Sterling motors. Speed 21½ miles. All modern conveniences.



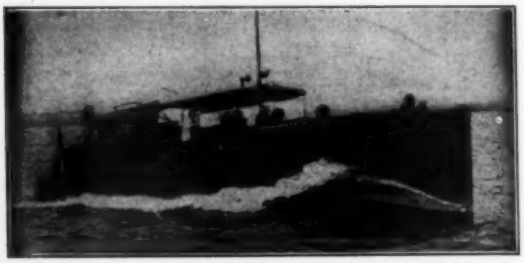
No. 9078—Sale or Charter—Fast 48 ft. express cruiser in commission. Immediate delivery—2 new 6 cylinder Van Blerck motors. Good accommodations. Thoroughly overhauled last year in all departments.



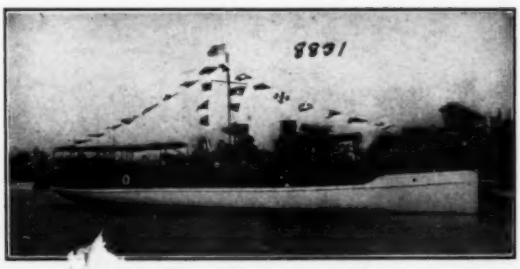
No. 8102—Sale—Charter—Most desirable raised deck cruiser available. Practically new. 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles. Electric light, hot water, heat and refrigerating plant.



No. 9075—For Sale—Desirable raised deck cruiser 70 ft. x 11 ft. x 4 ft. Good accommodations. Speed 23 miles.



No. 8978—For Sale—Raised deck semi-day cruiser. 200 H.P. Sterling motor. Speed 20 miles per hour. In the very best of condition. Price reasonable. Full particulars and plans from Tams & King, 52 Pine Street, New York.



No. 8 Exceptionally fast cruiser; 74 ft. x 10 ft. 6 in. x 3 ft. 6 i raft. New 300 H.P. 1920 6 cylinder Sterling motor; speed 25 miles. Good owner's accommodations. Further particulars om Tams & King, 52 Pine St., New York.

Advertising Index will be found on page 146

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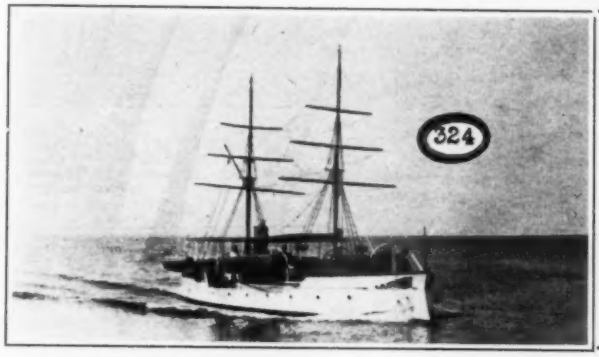
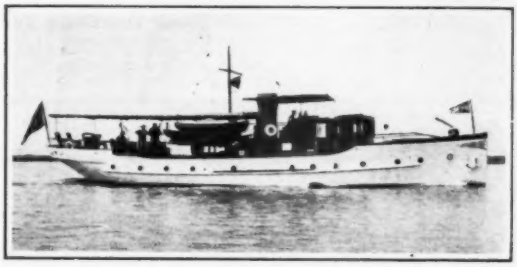
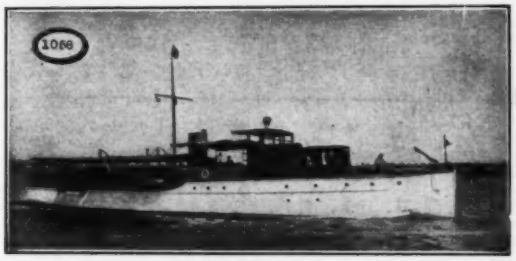


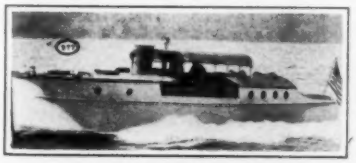
No. 324—For Sale—68 ft. cruising power yacht. Brigantine rigged 13 ft. 6 in. beam, 5 ft. draft. Two double staterooms, commodious dining saloon. 8 cylinder Sterling motor. Cruising speed 13 miles. Independent electric plant. Has received exceptionally good care and is in excellent condition. Now on Great Lakes and in commission ready for cruise. Very attractive price for immediate sale. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.



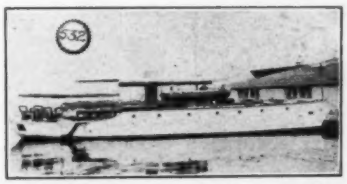
No. 560—For Sale or Charter—75 ft. x 14 ft. x 4 ft. 6 in. gasoline cruiser built 1915. Sterling powered. Very able seaboat, excellent accommodations below and on deck. Has deck dining saloon, two large staterooms, large main saloon and bath-room. Located Great Lakes. Reasonable price. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.



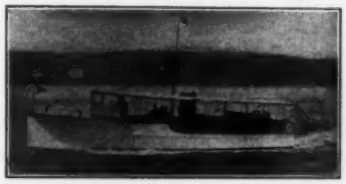
No. 1058—For Sale—desirable twin screw cruiser new 1921 93 ft. x 15 ft. x 5 ft. Powered with two 80-110 H.P. 6 cyl. Winton motors. Large deck dining saloon. Very commodious. Owner's double stateroom with large bath and dressing room. One double and single guest staterooms. Very attractively finished and equipped. Further particulars Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.



No. 977—For Sale—50 ft. Great Lakes Cruiser. Speed up to 20 miles. Accommodate 6 to 8. Excellent condition throughout. New motor 1922. Reasonable price. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

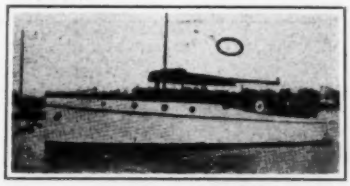


No. 532—For Sale—71 ft. twin-screw flush deck motor yacht. Built by Consolidated. Motors controlled from deck. Accommodations consist of one double stateroom, large main saloon, bath, etc. Attractive price. Located Great Lakes. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

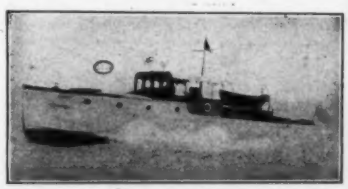


No. 1019—For Sale—60 ft. twin-screw express cruiser. Excellent seaboat. Speed up to 22 miles per hour. Accommodations excellent. Price reasonable. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

No. 173—For Sale—Very attractive bridge deck cruiser 55 ft. x 13 ft. x 4 ft. Powered with a 6 cylinder Sterling motor. Has large main saloon, forward double stateroom and bath in owner's quarters. Beautifully finished in mahogany. In excellent condition. Reasonable price. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.



No. 106—For Sale—40 ft. x 10 x 2 ft. 10 in. power yacht. One double stateroom, dining saloon, galley, two toilets. Sleeps 6-8. Speedway self-starting motor. Low price. Excellent condition. Henry C. Grebe & Co., Inc., 6 N. Michigan Ave., Chicago, Ill.



No. 1018—For Sale—54 ft. twin-screw express cruiser. Speed 20-25 miles per hour. Double stateroom and large main saloon. Two toilets and shower bath. Well equipped and in excellent condition. Henry C. Grebe & Co., Inc., 6 North Michigan Ave., Chicago, Ill.

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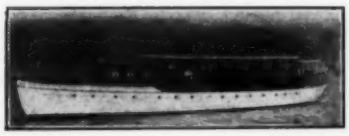
No. 2254—55 ft. bridge deck cruiser. Two double staterooms, main saloon, two toilet rooms. Two berths and toilet for crew. Sterling Motor. Speed 13-14 miles. Electric lights, etc. Splendid proposition.

No. 1664—Twin screw steel power yacht 110 ft. x 21 ft. x 4 ft. Five large staterooms, saloon, two bathrooms, etc. Two 125-150 H.P. Standard motors. Speed 12-14 miles. Located in Florida. Splendid proposition.

No. 4270—Keel Schooner; 105 ft. x 73 ft. x 18 ft. 6 in. x 11 ft. 3 in. Designed and built by William Fife, Jr. Built of teak. Hull coppered. Three double staterooms, main saloon, bath, etc. Splendid proposition. Excellent seaboat. Inspectable New York.



No. 2041—85 foot twin screw power yacht. Two double staterooms, two berths in main saloon. Two toilet rooms, galley, crew's quarters, etc. Two 65 H.P. 20th Century motors. Speed 14 miles. Electric lights, etc.

No. 2034—52 ft. express cruiser. Double stateroom, main cabin. Two toilet rooms, etc. 200 H.P. motor. Speed up to 24 miles.

No. 2014—71 ft. twin screw express cruiser. One double and two single staterooms, saloon, etc. Speed 20-25 miles. Can be bought at an attractive figure.

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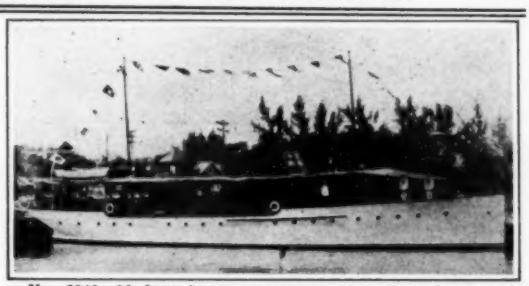
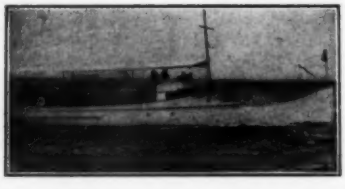
No. 5547—For Sale or Charter—170 ft. steel steam yacht. In excellent condition throughout. Dining saloon and social hall on deck. 6 staterooms, 2 baths. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 5048—93 ft. twin screw power yacht. Best design and build. Dining saloon and music room on deck. Owner's quarters and 3 staterooms. Bath. Price reasonable. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.

No. 6913—Mathis 75 ft. power house yacht. Deck dining saloon and 4 staterooms, baths, handsomely furnished. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 1175—57 ft. Elco Cruiser—2 double staterooms and saloon—6 cyl. Sterling motor, good as new. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.

No. 6920—One of the Great Lakes 54 ft. twin screw express cruisers. Speed 23 miles. Immediate delivery in commission. Price attractive. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.

Advertising Index will be found on page 146

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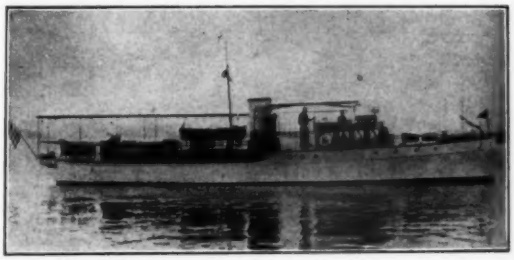
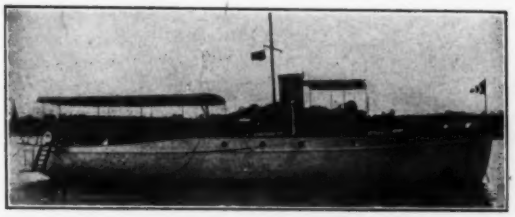
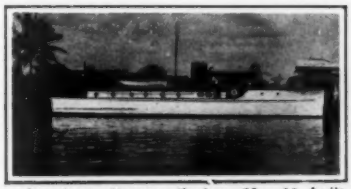


No. 2456—Excellent twin-screw power yacht, 72 ft. x 12.3; Lawley built, two 6 cylinder Wintons; speed 13 knots; two double staterooms, bathroom, dining saloon, etc.

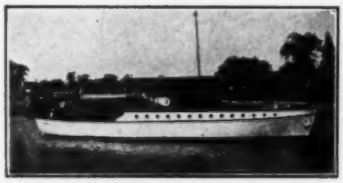


No. 1949—Able raised deck cruiser, 62 ft. x 12.9; new 8 cylinder Sterling motor; speed 13½ miles. Single and double stateroom, main saloon, etc. In first class condition.

No. 1973—Able cruiser, 56 ft. by 12 ft., new 6 cylinder Van Blerck motor, installed 1920; double stateroom, saloon, toilet room, etc. Price attractive.



No. 2008—Express Cruiser, 62 x 11, built by Herreshoff Mfg. Co. Two 8 cylinder motors; speed 20-23 miles per hour. Double planked hull, etc. Trial granted.



No. 1614—Raised deck cruiser, 57 ft. x 13 ft., Twentieth Century motor, 50 H.P. Three staterooms, saloon, etc. A1 condition.

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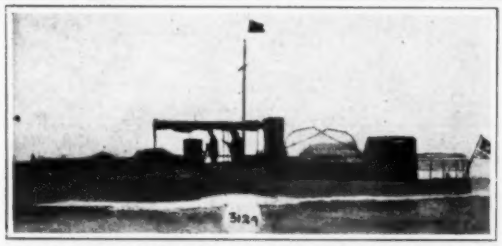
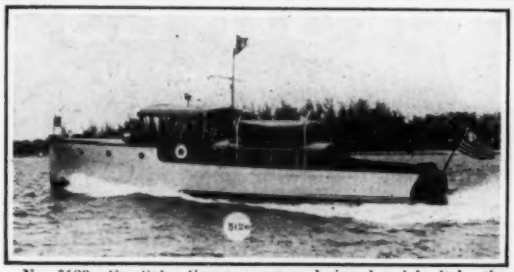
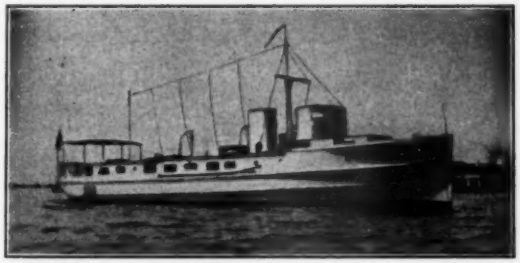


No. 3124—For Sale—Fast twin screw cruiser 55 ft. x 9 ft. x 3 ft. 6 in. draft. Two six cylinder motors 150 H.P. each. Speed up to 24 m.p.h. Ideal boat for fast ferry service. Price reasonable for a quick sale. For further particulars apply R. M. Haddock, Naval Architect & Yacht Broker, 50 East 42nd St., N. Y. C.



No. 3120—For Sale: Express cruiser designed and built by the Great Lakes Boat Building Co. Twin screw. Speed up to 20-22 m.p.h. One double stateroom. Now in commission. For further particulars apply R. M. Haddock, Naval Architect & Yacht Broker, 50 East 42nd St., New York City.



No. 316—For Sale: 59-foot Bridge Deck Cruiser, recent build. 70-90 H.P. Sterling engine 1917. A very able boat, economical to run. Price very reasonable. Apply R. M. Haddock, 50 East 42nd St., New York City.

No. 368—For Sale: Twin screw express cruiser 57 ft. x 10 ft. x 3 ft. draft. Excellent condition. Sterling motors. Speed up to 25 m.p.h. Two double staterooms. Can be purchased at a very reasonable figure. For further particulars apply R. M. Haddock, Naval Architect and Yacht Broker, 50 East 42nd Street, New York City.

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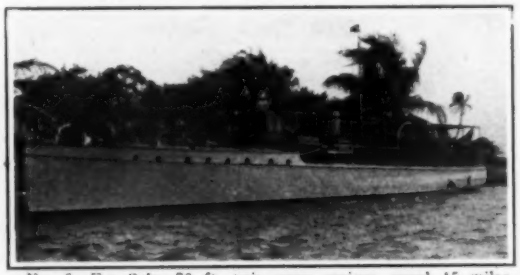
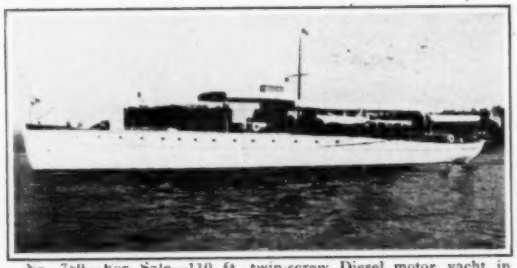
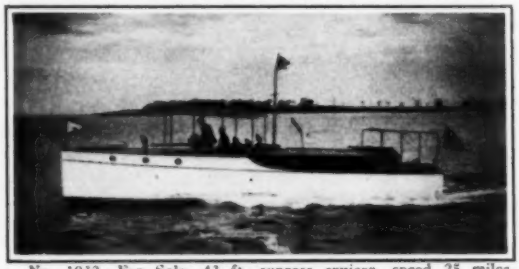


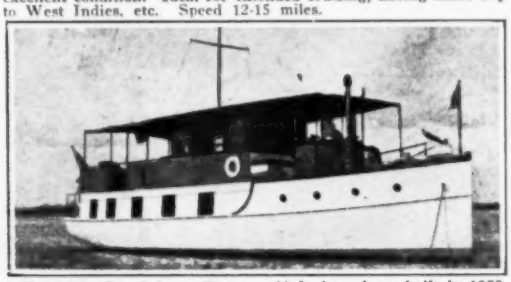
No. 5—For Sale—72 ft. twin-screw cruiser, speed 15 miles. 2 double staterooms and saloon. Enclosed cabin house added. Motors new 1921. Fine yacht for northern and southern waters.



No. 739—For Sale—110 ft. twin-screw Diesel motor yacht in excellent condition. Ideal for extended cruising, having made trip to West Indies, etc. Speed 12-15 miles.



No. 1032—For Sale—43 ft. express cruiser, speed 25 miles. Motor new 1921. Very beautifully furnished. Unusual opportunity, as she is a very snappy craft.



No. 1457—For Sale or Charter—52 ft. houseboat, built in 1920. 3 single and 1 double staterooms. Speed 9 miles. Others for sale up to 90 ft. in length. Good boats for Florida as well as northern waters.

REBUILT ENGINES

"THROUGH SERVICE WE GROW"

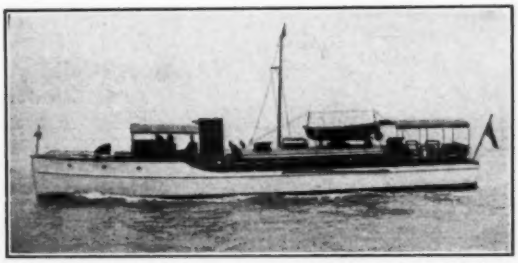
The Largest Distributors of New and Rebuilt Engines in the World

Our stock consisting of almost three hundred new and slightly used motors (more than was displayed at the entire New York Motor Boat Show) embraces all sizes, types and makes. Rebuilt, guaranteed and sold at a price consistent with the times. Let us figure with you on your next power plant.

Advise size and type of your boat and about the size engine you want.

Our bargain list will be sent anywhere on request.

Bruns, Kimball & Company
153-155-157-159 West 15th St.
New York City



For Sale—Yacht Celeritus, 61 ft. O. L. x 11 ft. 6 in. x 3 ft. 9 in. Designed by Swasey. Built by Jacobs 1916. Redesigned 1919. Motors overhauled 1920. Power plant, two Sterling eight cylinders 150/200 H.P. each. New power dingey built 1920. Perfect order. Complete inventory. Price, any reasonable offer considered. Must be sold this season. Apply Oliver, 417 Canal Street, New York.

Honestly Rebuilt

Don't buy any motor until you have our latest price list of Masters Rebuilt Motors. Thoroughly overhauled, all worn parts replaced, refinished and guaranteed like new. All sizes. Lowest prices. Write to-day.

W. L. MASTERS & CO.
Largest Engine Dealers in Central West
231 No. State St. Chicago, Ill.
AUTHORIZED DISTRIBUTORS FOR
STERLING KERMATH UNIVERSAL FRISBIE
STEARNS EVINRUDE JOHNSON
HYDE PROPELLERS JOES REVERSE GEARS

Advertising Index will be found on page 146

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 6 cents per word, minimum $1.50. If an illustration is used, the charge is as follows, which includes the making of the cut:

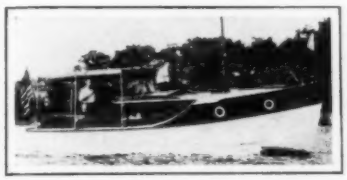
Cut one inch deep, two inches wide	$ 7
Cut 1½ inches deep, three inches wide	$10
Cut 2¼ inches deep, four inches wide	$15
Cut 2¾ inches deep, 7 inches wide	$20

Terms: Cash with order.

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.

Classified advertisements set entirely in small light face type. No extra charge for capitals. Bold face type used at display rate, $12 per inch, single column.



30 ft. x 9 ft. x 3, 40 H.P. Scripps comfortable cruiser—complete cruising equipment. Self-starter, electric lights, suitable South. Near New York, Ashland 7566. Joseph Bister, 920 Broadway.

For Sale—Masten Life Preserver vest, unused $5. Good Five-Power field glass $5. D. Davis, 361 E. Main St., Chillicothe, Ohio.

Florida tourist and yachtsman wanting to charter or purchase a yacht or small motor boat for the winter season, can get all information they desire by writing Capt. J. L. Scott, 236 S. W. North River Drive, Miami, Fla.

For Sale—New and rebuilt marine engines. Write for list of bargains. Anderson Engine Co., 4032 No. Rockwell St., Chicago, Ill.

WHO WANTS MY SERVICES?

Am exceptionally good at building up sales, at planning a marine gas engine sales campaign and at carrying it out. Can write unusually effective marine gas engine sales literature.

D. R., 810 Broad St., Newark, N. J.

For Sale—Hall-Scott four cylinder 100 H.P. high speed engine. Complete equipment, good as new, bargain for quick buyer. Price $200. M. D. Cooke, 333 Fulton St., Hampton, Va.

Wanted to purchase for cash after summer season is over 45 ft. to 48 ft. x 10 ft. sea-going cruiser. F. H. B., care MoToR BoatinG.

Wanted—Will pay cash for three berth cruiser 40 to 45 ft., about 8 to 9 ft. beam, or better. Must be in first-class condition, ready to cruise to Florida, providing party will take my 33 ft. x 7 ft. beam cruiser in part payment. I have a mahogany cabin, two berths, 4 cy., 4 cylinder Sterling motor, 20 to 35 H.P. Bosch dual magneto. Electric light, storage battery, generator, toilet, compass, searchlight. All in good condition. Now in service. Can be seen at any time by appointment. Address care of Box 39, MoToR BoatinG, 119 W. 40th St., N. Y.

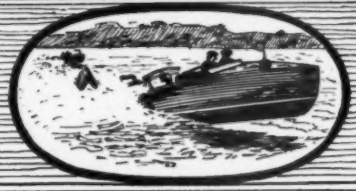
AUXL. CATS: "CROSBY" C. B. BOATS!

Husky Cat: 23 ft. x 11 ft. x 3 ft., Sq. Stern, 6 H.P.	$500
Seagoing: 26 ft. x 12 ft. x 3 ft., Sq. S., 10 H.P. Lath.	800
Modern: 25 ft. x 9 ft. x 2 ft. O. H. St. Fast. No motor	750
Varnished: 25 ft. x 10 ft. x 3 ft. Cruiser. No motor	900
CHAMPION: 30 ft. x 24 ft. x 2 ft., new sail. Fine buy	750
Lawley built 32 ft. x 24 ft. x 3 ft. C. B. Sloop. OK	750

ROSEMOND, 4th St., Greenport, N. Y.

For Sale—Power cruiser 47 ft. x 12 ft. x 3 ft. 9 in. Built August, 1920. Speed 12 M.P.H. 4 cyl. Sterling engine. Separate electric lighting plant. Mahogany finish below and on deck. 3 toilets. Crew's quarters sleeps two. Owner's quarters, two staterooms and main saloon, sleeps seven. Bridge deck control. Engine room in separate compartment under. In A1 shape, fully found and now in commission. For further particulars address MoToR BoatinG, Box 35.

Wanted, for October delivery in Boston or New York, modern raised deck or cabin trunk cruiser, about forty feet. Must be by good builder and fully equipped. Send photograph or drawings and specifications and inventory equipment. Advise original cost, present price and where may be seen. Edward W. Bell, Jr., Savannah, Georgia.



RACING

Under the class rules now in force the low powered motor boat has the same chance of winning as the high powered and expensive craft.

This is resulting in a vast expansion of the sport as shown by the races of last month.

GET INTO THE GAME

Our Catalog will be of great use to you in your plans. Sent on application.

GEO·B·CARPENTER & CO.
MARINE SUPPLIES
Sailmakers and Riggers
200 W. Austin Ave. Chicago

GENUINE HARTHAN TRUE SCREW PROPELLERS

The principle of a True Screw is strictly followed out in the patterns from which all genuine Harthan Propellers are made. This type is known to be the most efficient.

Harthan wheels are made of a special bronze composition, very tough and strong. This allows a very thin blade, the edges of which are brought down very sharp, which, with the extra high polish, reduces the power-absorbing element to a minimum.

We can supply propellers with two or three blades, in practically any pitch, either right or left hand.

Look for the Trade-Mark on Each Blade
McFARLAND FOUNDRY & MACHINE COMPANY
1100 Willow St.,
TRENTON NEW JERSEY
Representatives
NEW YORK: Topping Bros., 122 Chambers Street.
PHILADELPHIA: F. Vandercherchen's Sons, 7 N. Water Street.

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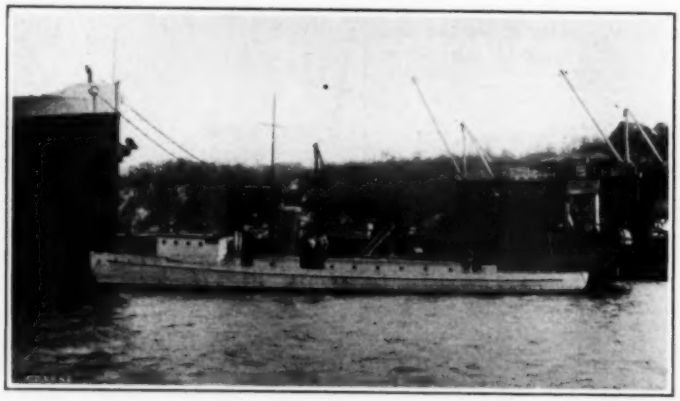


For Sale—Steam Yacht "ORCA"—83 ft. x 11 ft. x 4 ft. draft. Geo. Lawley's Sons triple expansion engine. Cylinders 6½ in. x 10 in. x 16¾ in.; stroke 9¾ in. Roberts water tube boiler. Cabin 8 ft. x 13 ft. Two staterooms, each 7 ft. x 10 ft. Toilet and bath. Galley. Crew's quarters, 10 ft. x 25 ft. Yacht equipment very complete. Address New York Harbor Dry Dock Corp., 32 Pearl St., New York. Phone Bowling Green 5055.

Sea Captain is open to accept winter engagement South. Qualified Bahama Islands, Gulf Coast, Atlantic Seaboard and Great Lakes. Sail or power. Box No. 36, MoToR BoatinG.

Six cylinder Model F M Sterling marine engine, 5½ x 6¾ bore and stroke, 85-125 H.P. Complete with electric starting and lighting outfit and all equipment back to and including coupling. Engine late model with aero metal base, run less than 500 miles, guaranteed perfect in every respect. Will sell it at a very low price to a quick buyer. Marine Engine Co. of Philadelphia, Machinery Exhibit, Philadelphia Bourse, Philadelphia, Pa.

A few pair of very powerful and clear Bausch & Lomb Prism Binoculars, 6 x 30 power, complete with case, etc. Worth $75.00, will take $40.00. Percy M. Child, 1110 14th St., N. W., Washington, D. C.

One 70 volt, 75 amp. direct connected Winton four cylinder generating plant, worth $1250.00, will take $500.00. One 110 volt, 39 amp. direct connected Winton four cylinder generating plant, worth $1250.00, will take $600.00. One 110 volt, 15 amp. direct connected one cylinder Carlisle & Finch generating plant, worth $350.00, will take $175.00. One 18 in. Rushmore search lamp, 35 amp., deck type, will take $125.00. One set large galv. running lamps, both oil and electric, suitable for vessel up to 100 ft., complete four lamps, $20.00. Let me quote you on marine search lamps, all sizes. Percy M. Child, 1110 14th St., N. W., Washington, D. C.

Position Wanted—Energetic young man, 22, Christian character. Experienced in operating and navigating motor boats. Finest references. Prefer small private craft. Box 37, care MoToR BoatinG.

TRIMOUNT WHISTLE BLOWER OUTFITS

Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.

Made in 3 sizes.

TRIMOUNT ROTARY HAND BILGE PUMPS

All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.

Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., E. Dedham, Mass.)

For Sale—Raised deck cruiser—34 ft. x 9 ft. Port lights and windows, four cylinder, four cycle motor, spring bunks, electric lights, running water, large locker, completely equipped for cruising. Can be seen Stuyvesant Yacht Club, Pelham Bay, or write Box 38, MoToR BoatinG.

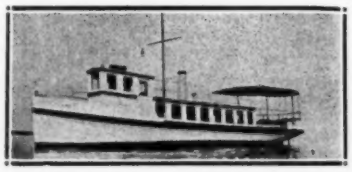
FREE Illustrated Literatures. Outboards, New and Rebuilt Engines. Universal Joints, Pumps. Clutches, Gears, Hyde's, Gordon Reversible Propellers, etc. Canadian Boat & Engine Exchange. Toronto.

For Sale—Bridge Deck Cruiser, length 36 ft. 6 in., Beam 9 ft. 6 in., Draft 38 in.; 25-35 H.P. Peerless Marine Engine. Boat and engine almost new. Must sell at a sacrifice. Can be seen Cotter's Boat House, mouth Westchester Creek, Bronx, or communicate Ozab, 1016 Hollywood Ave., Throgg's Neck, Bronx, N. Y. C.

For Sale—A 58 ft. O. A. Auxiliary Ketch with a new 40 H.P. 4 cycle Lathrop engine. Contains a large saloon and 2 single staterooms besides galley and toilet. Accommodates 4 aft and 2 in forecastle. Excellent for off-shore or southern cruising. Paul Marco, Box 248, Point Pleasant, N. J.

Four Cycle	
4 HP Dunn, 2 cyl.	$40.00
6 HP Universal, 2 cyl high speed	45.00
6 HP Dunn, 3 cyl.	55.00
8 HP Dunn, 2 cyl.	65.00
10 HP Doman, 2 cyl.	110.00
12 HP Holliday, 2 cyl.	105.00
12 HP Lamb, 2 cyl.	115.00
9-12 HP Universal Unit, 4 cyl.	215.00
12 HP Samson, 3 cyl.	95.00
16 HP Dunn, 4 cyl.	115.00
25-30 HP *New* Erd, 4 x 6, 4 cyl.	215.00
30-35 HP *New* Doman, 5 x 6, 4 cyl.	275.00
45-50 HP *New* Doman, 6 x 7, 4 cyl.	425.00
45-50 HP Globe, heavy duty, with gear, etc.	650.00
One Cylinder, Two Cycle	
4 HP New Perfection	$65.00
6 HP Williams, heavy duty	55.00
8 HP Pierce, "as is"	35.00
Two Cylinder, Two Cycle	
6 HP Gray	$65.00
10 HP Northwestern	75.00
15 HP Ferro, "as is"	45.00
12 HP Gray, "as is"	40.00
Three Cylinder, Two Cycle	
12 HP LaCrosse, "as is"	$35.00
15 HP Elmore	55.00
15 HP Tuttle	85.00

THE BADGER MOTOR COMPANY
Milwaukee, Wis.



FOR SALE—Glass cabin cruiser 50 x 12 x 3, 60 H.P. 6 cylinder, 4 cycle Speedway motor. Thoroughly overhauled. Put in commission May 1st, 1922. Equipped with 50 life preservers, 25 deck stools, 6 volt Philadelphia battery, cook stove, toilet, wash room, etc. Fine party, ferry or fishing boat. Carrying 50. Speed 20 miles. Can be seen at Glen Cove, Long Island, N. Y. Write—F. MacDonald, P. O. Box 192, Locust Valley, Long Island, N. Y.

For Sale—D-1-6—six cyl. Scripps Marine Motor, 75 H.P., complete with starting, lighting and reverse equipment. Ideal for cruiser or runabout. Price $1,100.00.

One six cyl. 150 H.P. Hall-scott motor, complete with manifold, water pump, flywheel, couplings and oil-cooling coil. No starter or reverse gear. Price $550.00. E. J. Morris, Morris Bros. Shoe Co., Quincy, Ill.

I WANT TO BUY

Raised deck type cruiser.
45 ft. to 60 ft. in length.
Economically powered.

Comfortably arranged inside. Give full particulars of your boat, including photograph, if possible, and where it may be inspected. W. W. Baker, Torresdale, Philadelphia.

For Sale—Hand "V" bottom runabout, built by Chris Smith. 28 ft. over all, six cylinder Van-Blerck motor, 120 H.P. Just overhauled. Speed 31 miles per hour. Price $3,500. E. A. Haynes. Port Huron, Michigan.

New Propellers three blade right hand bronze:

14 in.	$4.75
16 in.	6.20
18 in.	7.30
20 in.	9.60

Bored as specified $1.50 each. They won't last long, get a spare if you need it at real bargain prices. Kermath Manufacturing Co., Detroit, Michigan.

For Sale—The "Peter Pan II", of international reputation. New 135 H.P. Sterling engine, was out of commission 3 years. Electric starter, better than ever. Price $2,000. For full particulars address Box 5, Moriches, Long Island, New York.

For Sale—35 ft. double sheathed mahbgany Auto style Motor Boat. Built by Leyare Boat Works, Ogdensburg. 6 ft. beam, 6 cylinder, 45-75 H.P. Sterling engine. 25 miles per hour, hull and engine completely overhauled. R. F. Alence, 120 Broadway, N. Y.

For Sale—An open runabout 26 ft. x 6 ft., 10 horsepower, 4 cylinder Niagara, hull and motor just overhauled and put in first-class condition. Would make good passenger boat, capacity twenty persons, speed 12 miles. 178 Warwick Ave., Rochester, N. Y.

CABIN CRUISER "AJAX"

31½ x 6½ ft. beam, powered with a six-cylinder Mitchell automobile engine, Bosch magneto, Rayfield high-speed Carburetor, Gies Reverse gear, electric cabin and running lights toilet, large covered cockpit, speed 17 miles per hour. All equipment included. First-class condition. Can be seen any time at Cooper River and Erie St. Camden, N. J. Owner at 833 Grant St., Camden, N. J., any night after 6 o'clock. Bell phone Camden 332-W. Best offer takes it, must be sold by Sept. 1st, owner going west.

Advertising Index will be found on page 146

Trustworthy Motors Only

Straightforward One Price

Exactness of All Statements

MARINE ENGINE CO OF PHILADELPHIA

THIS company has been organized to handle the sales and service in Philadelphia and surrounding territory for a representative line of high-grade marine engines and allied marine products.

Amply financed and well equipped by years of experience, the Marine Engine Company of Philadelphia promises maximum service and satisfaction alike to the manufacturers it represents, and to the boat owners, marine engine buyers and boat builders of its selling territory.

Complete stocks of engines are carried on hand for prompt delivery, including spare parts for same. Serviceable engines will be accepted in trade and thoroughly rebuilt before reselling with a full year's guarantee.

Authorized Distributors for

Hall-Scott Marine Engines
Wright Reliable Engines
Automatic Engines
Scripps Motors
Gray Motors, 2 & 4 cycle
Brennan Standard Motors
Sturdy Motors
Niagara Motors
Unimote 2 K.W. Electric Plant
Universal 4 K.W. Generating Set
Hyde Propellers

We want you to get acquainted with our facilities to serve you. Come in and get acquainted.

MARINE ENGINE CO. OF PHILADELPHIA

H. H. Kramm, President D. C. MacNeill, Treasurer H. B. Foster, Secretary

BOURSE BUILDING, PHILADELPHIA, PA.

WE CARRY HYDE PROPELLERS IN STOCK

REBUILT ENGINES taken in exchange for new motors, thoroughly overhauled, rebuilt and GUARANTEED.

Our present stock includes Sterling, Van Blerck, Peerless, Hall, Automatic, Red Wing, Lamb, Globe and many others from 2 H.P. up.

Write today for latest complete list with prices.

We would like to have every motor boat owner and prospective engine purchaser to write to us for a catalog of the famous Brennan standard 4 cycle motor. This motor is of the highest grade, and is complete in every detail. The 17-20 H.P. motor with electric starting and lighting outfit, flexible coupling complete, retails for $650.00. The 25-35 H.P. motor, same as above, retails for $800.00.

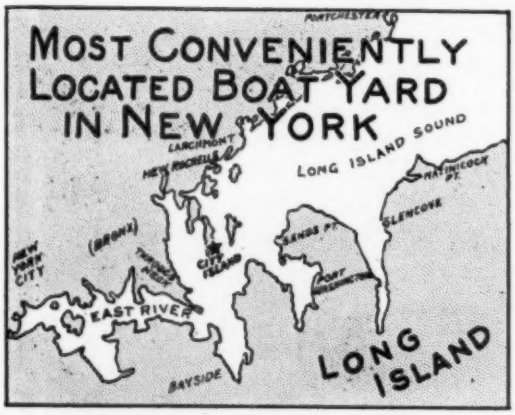
"The HOUSE of WOOD"

Preparing for the Florida Cruise

THE success of your cruise to Florida depends upon the degree of care and skill devoted to the preparation of your boat. For this work you will find the HOUSE OF WOOD ideally suited in experience, reputation, location and equipment.

This yard has every facility for performing the many varied operations included in the overhauling and repair of power plant and hull. Situated on the tip of City Island at the head of Long Island Sound, it is the most conveniently located boat yard in New York waters. Our workmen are experienced boat craftsmen, organized into separate corps specializing on each class of work; many of these men have been with us from 10 to 30 years.

For more than sixty years the HOUSE OF WOOD has been famed for the fine sail and motor yachts it has produced. Many record holders of past and present, designed by the foremost naval architects, have been built by this organization. There can be no question about the quality of WOOD workmanship or of our ability to meet the most exacting demands.



We solicit your inquiry for quotations on any kind of repairs or refitting, as well as on building boats of any size or type in wood, steel or composite construction.

You will be interested in our booklet giving the history of the HOUSE of WOOD. This is mailed on request to any boat owner.

B. F. WOOD
INCORPORATED

Marine Street, City Island, New York City

BUILDING REFITTING REPAIRS STORAGE

INKOSI, 65-ft. express cruiser designed by Wm. Gardner and built by the HOUSE of WOOD for Mr. Philip De Ronde of New York.

Advertising Index will be found on page 146

NAVAL ARCHITECTS & YACHT BROKERS

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER
Offices
Lafayette Bldg., Chestnut and Fifth Sts.
PHILADELPHIA, PA.

BURGESS & PAINE
NAVAL ARCHITECTS
YACHT BROKERS
131 STATE ST. BOSTON, MASS.

COX & STEVENS
Naval Architects and Engineers
Yacht Brokers
25 Broadway, Cunard Building
(Morris St. Entrance), New York City
Telephone 2700 Whitehall

EDWARD CARROLL NAVAL ENGINEER
18 years experience, steel and wood construction with leading yacht designers and U. S. Navy.
Diesel Engine Specialist
I charge a fixed price for my services; not a percentage of cost. This, with my knowledge of the markets, insures a maximum of value at minimum cost. In justice to yourself, let me submit a sketch to your requirements.
2830 Kansas Road, "Fairview", Camden, N. J.

B. T. DOBSON
Naval Architect Yacht Broker
(P. O. Box 407) New Bedford, Mass.
Designer of Sailing Craft, Auxiliaries and Motor Boats. Specialist in V-Bottom Type.

William H. Hand, Jr.
NAVAL ARCHITECT
NEW BEDFORD, MASS.
HAND-V-BOTTOM DESIGNS
Every design, now as always, my personal work. Send stamp for catalog illustrating forty-three typical Hand-V-Bottom designs.

R. M. HADDOCK
NAVAL ARCHITECT
Sail or Power Yachts, Houseboats and Commercial Vessels
Yacht Broker Sales and Chartering
50 East 42nd St. New York City

CHARLES D. MOWER
Designer of
SENSIBLE CRUISERS
POWER—SAIL—AUXILIARY
Twenty-five years' practical experience
350 Madison Avenue New York City

Yard and Shop

(*Continued from page* 48)

races which have been held on the west coast and has always been among the first three to finish and has frequently been a winner. It is the most consistent performer and while an aviation motor now and then succeeds in winning a race the Sterling powered boat performs every time.

The Sorg Oil Engine

An oil engine which is designed to run consistently on any liquid fuel that will flow through the carbureter is one made by the Sorg Oil Engine Company, Denver, Col. The theory of operation of an internal combustion engine is based on the compression, and this engine is designed so that the compression is constant. Many years of service make no difference in the compression. The cylinder remains round and the piston cannot score or wear the cylinder walls. The charge of air and fuel cannot leak out during compression and the engine starts without spinning the fly wheel. The complete vaporization of the fuel makes for uniform power and the air cushion at the end of each stroke eliminates noise and saves the bearings.

Free Course in Yacht and Ship Design

The fifth season of the Cooper Union Free School of Yacht and Ship Design will open on the evening of September 25, 1922. The class is held three evenings a week, lasting until about May 1, and is open to any male citizen who has had some instruction in the use of drafting instruments and who is familiar with the construction of either small boats or ships.

Students may elect to either study the design of small power or sail boats or to take up ship work. The regular course is for two years, but students will be given a certificate at the end of the first year if they do not care to take up a second year. The work includes the actual drawing of a full set of plans of any type of boat desired by the student. All of the necessary calculations are explained in lectures as well as by practical application. There is no charge whatever for the course, all the student has to supply is the necessary instruments, paper, etc.

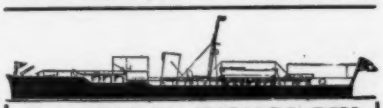
Graduates of this course are capable of obtaining good positions with naval architects and many of those who have passed in preceding years are now so employed. Applications should be made immediately by mail to Secretary, Cooper Union, Cooper Square, New York. All who are desirous of joining the class should also appear on the evening of September 22, at 7:30 P. M., to Room 31, Cooper Union. They should bring samples of drawings made by them when applying.

Airplane Motors for Marine Use

The following was not written for publication, but is an extract from a confidential letter written by a prominent boat builder, who has been trying to re-build a number of airplane engines for marine use.

"A lot of our profit has gone into getting these motors in running condition. The motors seem to be o. k., but the equipment applied seems to be where all the trouble is. Any of these aviation motors are good, but when you get them where they ought to be, you have just about as much invested as what a good marine motor can be had for, and nothing of a re-sale value after you have it. I am going to stick to legitimate marine motors from now on."

FREDERIC S. NOCK
NAVAL ARCHITECT
Yacht Builder, Marine Railways, Storage and Repairs
East Greenwich, Rhode Island, U. S. A.



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What is a Bearcat?

OWING to the wide-spread fame of the Belle Isle Bearcat, both here and abroad, there is a growing popular tendency to refer to all fast runabouts as "Bearcats."

Although this is a source of gratification rather than concern to the builders, it seems nevertheless fitting at this time to obviate confusion by defining the term, "Bearcat."

A Bearcat is a standardized 26 ft. "V"-bottom, walnut-trimmed mahogany runabout equipped with a four cylinder, 125-hp. Hall-Scott Marine motor, guaranteed to develop a speed of 32 M.P.H., and built exclusively by the Belle Isle Boat & Engine Company.

All Bearcats have exactly the same hull dimensions: 25' 11" by 6' 6", are salt-water equipped and are built with heavily reinforced sterns to withstand the tremendous stresses encountered when maneuvring in a 60-ft. circle at full speed.

Being of standardized construction, all Bearcats are exactly alike both in workmanship and performance. This enables the purchaser of a new Bearcat to know that his craft will do anything he has ever seen or heard of another Bearcat doing.

After a long period of experimentation, the first standardized Bearcat was built in the fall of 1920. Thereafter a large number of the boats was built for spring delivery. Since that time, however, it has never been possible to raise production ahead of incoming orders. As a result there are more privately owned Bearcats in service today than any other single type of runabout.

While constructed primarily as a seaworthy family runabout, and not as a racing boat, the Bearcat is a consistent winner at important regattas. In its most recent triumph, a Bearcat owned and driven by Dick Locke, Detroit, won the coveted Inter-State trophy against all comers in 625 cu. in. class powerboat race, a free for all event at the Inter-Lake Yachting Association's annual regatta at Put-in-Bay, July 19-21, this year.

Standard Bearcat $6,500 Complete, Plus Tax.
Special Bearcat with 6 cyl. Hall-Scott Marine $7,500, Plus Tax.

Belle Isle Boat & Engine Co.

Builders of Belle Isle Bearcat.

9662 E. Jefferson Ave. Detroit, Dept. B.

Rare Sport at Chicago

(*Continued from page* 11)

down with his waving flags, started them off with dropping ball and sounded their success or defeat with cannon roar. Prominent boating men from midwest, east and south assisted with the work of the races in various capacities on the barge and in the pier headquarters, with Commodore Sheldon Clark, chairman of the regatta committee, as the tireless, ever efficient boss. On the barge the Commodore's assistants included F. G. Ericson, of Toronto; R. E. Berlin, of New York; Wm. J. Blake, Chicago; Capt. E. A. Evers, Chicago; Ira Hand, New York; Wm. F. Meier, Cleveland, Ohio; W. H. Parham, New Orleans; Leroy Cook, Chicago; Robert E. Power, Cleveland; Gerald T. White, New York; John G. Robinson, Cleveland; M. E. Mutchler, Buffalo, N. Y.; A. W. Parkin, Chicago; W. W. Nutting, New York and W. L. Doxsey, of Chicago. In charge of pier headquarters were R. H. Daniels and A. T. Griffith, of Peoria, Robert Tarrant, Chicago; M. W. Otteshagen and C. C. Fauquier, of Chicago. Chicago motor boat men manned the judge's stations at various points on the course.

But on with the race!

Boats were entered according to classes, based on piston displacement and races were run in three heats, one each day. On account of the high seas, which lift the sailors to joy but plunge the speed boat pilot in gloom, events for the last day of racing, Sunday, were for the most part greatly shortened, only a half or less of the laps being run.

Generous cash purses were up for each event and were given for heats. Despite the handicap of weather conditions the races were run off promptly.

Only those to whom boats is boats regardless of power plant, were doubtful of the outcome of the Great Lakes Championship twenty-mile event, by which Miss America I retained possession of the magnificent Harry F. Sinclair trophy and won a handsome purse as well. Miss America I was driven by her owner, Gar Wood, of Detroit, whose brother was at the wheel of Miss Chicago, Sheldon Clark's champion craft. Brothers also, sons of Chris C. Smith were at the engines of these two speed demons and the two sets of brothers put on a spectacular race. In the final lap each day Miss America I, with her twin engines, easily romped away from her single engine competitors. Miss Chicago placed second in each heat and third and fourth places were taken variously by Miss Dubonnet, Baby Sure Cure, Badger Girl (Finley Bailey, Peoria) Fore, (W. D. Foreman, Chicago) and Van Dyke II (J. E. Walmsley, Evansville, Ind.). Fore, a new boat and a good one, like Miss Dubonnet, labored under the handicap of unsuccessfully repaired injuries.

The big breath taking race of the regatta was the Single Engine free-for-all at fifteen miles, in which Miss Chicago and Baby Sure Cure met in renewed rivalry and runners-up were Fore, Miss Dubonnet, Century Tire (C. J. Venn, Chicago)—another new boat and of Hacker design Badger Girl, Van Dyke II and Bradley Tech (Phil Becker, Peoria). In the first heat Baby Sure Cure gave the spray to Miss Chicago with 35 seconds to spare. Boosters for the Detroit craft were wreathed in smiles, while Chicago fans, from Commodore Clark down to the sandwich boy were worried a bit. The accident to Baby Sure Cure the next morning prevented a real decision on this rivalry and to judge from what one hears, where talk is thick, there is much to be said on both sides. Suffice it to say that Miss Chicago did much of the first heat with a sadly twisted propeller; that her straightaway record nears 75 m.p.h. and——and——Oh, well, the score will be settled when they meet again.

Miss Chicago—and by the way, F. G. Ericson, of Toronto, was at the wheel of the Chicago the last day of the racing, with two firsts and a second place retained the single engine hydroplane championship and the Edgewater Beach hotel trophy, which therefore will continue to repose in honor among the gleaming silver trophies, adding no little to the decorations of the Chicago yacht club. Fore won the second place on points in this free-for-all event and Miss Dubonnet third.

Peggy, the only Milwaukee entry, owned and driven by Fred Schramm of that city, took the point honors of the 1300 event with a second, a third and a fifth place, although Oh Min, genial Harry A. Parsons, of Cleveland her owner, at the wheel, went over the line in first place in the first and second heats, but was prevented from entering the third by a balky engine. Bulk of the first money therefore went to Parsons and second place on points. Meteor III: (Walter B. Wilde of Peoria, owner and Leroy Bryant of the same city, driver) took a third of the first money with a first place in the third heat. Badger Girl, built by her owner, Finley Bailey of Peoria, took third place on points in this event and part of the money as well. Bradley Tech, Van Dyke II, Cecile (J. Q. Gill of Peoria) and Lady Racine, (M. Draeger, Racine, Wis.) also copped a share of the coin put up for the 1300 class. Jimmie Bailey was the little busy bee of the regatta drivers, driving both the Badger Girl and Miss Peoria, shuttling back and forth from one to another, and averaging six heats daily.

(*Continued on page* 64)

Advertising Index will be found on page 146

Belle Isle Bear Cat

HALL-SCOTT

EQUIPT

Wins Inter-State Trophy at Put-in-Bay

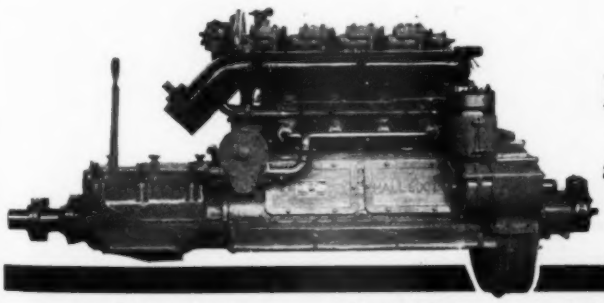
ONE of the most sensational races ever run was the final heat for the Inter-State Trophy at the recent Put-in-Bay regatta of the Inter-Lake Yachting Association. Belle Isle Bear Cat again proved its right to the title of America's most successful standardized speed runabout.

Losing the first heat by half a mile, taking the second by 2½ miles, Bear Cat and its opponent ran the third heat neck and neck for 20 miles, only 50 ft. apart at the finish, Bear Cat winning by just 4 seconds.

More remarkable than the average speed which was 31.85 miles per hour is the fact that there was only 6 seconds difference between the fastest and slowest laps. That is consistency, typical Hall-Scott consistency.

This is the original Belle Isle Bear Cat, the forerunner of more than a score of duplicate 26-ft. mahogany Bear Cats, with the four cylinder 125 H.P. Hall-Scott Marine Motor as standard equipment. Built primarily as a comfortable family runabout this Bear Cat is still winning races after nearly 10,000 miles of Great Lakes cruising during the past three seasons.

Whether you prefer a runabout or cruiser you will be sure of a fast and consistent boat if you install a Hall-Scott Marine Motor. Write today for descriptive catalogs.



Single and Twin Screw Plants in Stock at

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Rare Sport at Chicago

(*Continued from page 62*)

There are many who refuse to see the point of this point system claiming that money talks and that a part of the purse in the hand is worth any number of points in the bush or anywhere else. Its advocates, however, insist that by their points shall ye know them and so it goes and therein lies room for many an arguing match.

Many of the old Valley favorites scored down for the start of the 705 event including Peggy, Black Diamond (Barrick and Weber, Peoria), Meteor III, Janet Virginia (Walter Plummer, Maywood, III) Cecile L. and R. (Laughlin and Recher, Peoria) and the P. D. Q. VI the 215 class boat of President A. C. Strong, of the M. V. P. B. A. The first lap of the first heat saw them all in the field, but the L. and R. spilled her crew into the waves before half way around the course and was out of the running. Meteor III developed most unmeteoric tendencies and dropped out. Peggy finished first, Black Diamond second and Cecile third. The second and third days Meteor III was herself again and headed the field easily. Peggy came in second and Black Diamond followed third. Point ranking for the event gave Peggy first, Black Diamond second, and Meteor III, third.

The 320 event was made one of the most interesting on the program by the fact that the only woman hydroplane driver, Mrs. Ethel Salisbury Hanley, held the wheel of one of the winning boats, Ethel X, owned by her husband, Chas. P. Hanley of Muscatine, Ia. Cheered on by the big crowds Mrs. Hanley drove Ethel X to first place in the first heat followed by Van Dyke II, P. D. Q. VI, Margaret III, Miss Peoria and Miss Quincy, the last three coming up from the 151 class. Mrs. Hanley left Chicago Friday and evidently took the good luck fairy of the boat with her for Van Dyke II, with J. E. Walmsley at the wheel won first in both the second and third heats. High points therefore went to Van Dyke II, with Ethel X a close second and P. D. Q. VI third.

Points and place plus purse clashed again in the 215 class results for while Miss Illinois, built by J. E. Barteau of Chicago and owned and driven by Robert Lee, of Dubuque, Ia., raced over the finish line the first in the first two heats, she ranked only third in points, failing to start the third heat. P. D. Q. VI gained first in points with two seconds and a first. Margaret III held third points and Miss Peoria fourth. Shirley Jane owned by M. J. Harkless, of Harvey, Ill. finished only the first lap of the first heat, then dropped out with engine trouble.

In the kindergarten or 151 class the baby speed demons Margaret III (L. E. Selby, Pekin, Ill), Miss Quincy (C. E. Padgett, Quincy, Ill.) and Miss Peoria (R. H. Daniels, Peoria, Ill.) met the new Bud Six owned by Albert Schmidt, of Chicago. The babies played follow the leader, with Margaret III as It, for the three heats, with Miss Peoria second in the first and second heats and Miss Quincy second in the third.

The final race for supremacy between the sturdy speedboats and the unsought entries, Wind and Wave, came Monday when the delayed speed trials originally scheduled for Sunday had to be abandoned. Once again the god of weather chuckled, and Wave urged on by Wind wouldn't even wait for the starter's gun but raced on regardless of M. V. P. B. A. rules and boatmen's imprecations alike. So with a parting See you at New Orleans the speed boat men just took up their boats and went home.

Complete Summary of Results for All Contestants in the Pageant of Progress Races, Chicago, Ill., August 3, 5, and 6, 1922—Course 2½ Miles

The time given are for the successive days racing for each boat. The first, second, and third line referring respectively to the races held on August 3, 5 and 6.

Class: Great Lakes Championship—Distance 20 miles: last day 5 miles: 8 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*3rd Lap*	*4th Lap*	*5th Lap*	*6th Lap*	*7th Lap*	*8th Lap*	*Total*	*Points*
Miss America	Gar Wood, Detroit, Mich.	2:33	2:44	2:43	2:46	2:44	2:34	2:31	2:33-2/5	21:08-2/5	18
		2:55	2:51	2:55	2:57	3:01	3:02	2:57	2:12	22:50	
		3:26	2:47							6:09	
Miss Chicago	Sheldon Clark, Chicago, Ill.	2:32	2:41	2:45	2:48	2:45	2:34	2:31	2:32-4/5	21:08-4/5	15
		2:54	2:53	2:54	2:57	3:01	3:02	2:59	3:05	23:45	
		3:20	3:22							6:42	
Miss Dubonnet	Chas. Ferran, New Orleans, La.	D.N.S.								D.N.S.	4
		D.N.S.								D.N.S.	
		3:29	3:24							6:53	
Baby Sure Cure	P. Strassburg, Detroit, Mich.	2:41	2:43	3:14	2:33	2:30	2:31	2:27	2:30	21:09	4
		D.N.S.								D.N.S.	
		D.N.S.								D.N.S.	
Fore	W. D. Foreman, Chicago, Ill.	2:50	2:53	3:00	3:00	3:07	2:58	3:06	3:07	24:01	4
		D.N.S.								D.NS.	
		D.N.S.								D.N.S.	
Badger Girl	F. Bailey, Peoria, Ill.	D.N.S.								D.N.S.	4
		3:43	3:52	3:42	3:41	3:32	3:36	3:30	2:48	24:24	
		D.N.S.								D.N.S.	
Van Dyke II	J. E. Walmsley, Evansville, Ind.	D.N.S.								D.N.S.	4
		D.N.S.								D.N.S.	
		5:25	5:13							10:38	

Class 151—Distance 5 miles: last day 2½ miles: 2 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*Total*	*Points*
Margaret II	L. E. Selby, Pekin, Ill.	4:47	4:45	9:32	12
		4:52	4:48	9:40	
		6:14		6:14	
Miss Peoria	R. H. Daniels, Peoria, Ill.	4:49	4:47	9:36	8
		4:55	4:49	9:44	
		6:36		6:36	
Miss Quincy	C. E. Padgett, Quincy, Ill.	D.N.S.		D.N.S.	5
		4:52	4:53	9:45	
		6:25		6:25	
Bud Six	Albert Schmidt, Chicago, Ill.	D.N.S.		D.N.S.	1
		6:17	6:30	12:47	

Class 215—Distance 5 miles: last day 2½ miles: 2 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*Total*	*Points*
P. D. Q. VI	A. C. Strong, Evanston, Ill.	4:32	4:25	8:57	19
		4:27	4:18	8:45	
		4:35		4:35	
Margaret III	L. E. Selby, Pekin, Ill.	4:30	4:32	9:02	16
		4:30	4:34	9:04	
		4:48		4:48	
Miss Illinois	Robert Lee, Dubuque, Ia.	4:27	4:11	8:38	14
		4:24	4:19	8:43	
		D.N.S.		D.N.S.	
Miss Peoria	R. H. Daniels, Peoria, Ill.	4:37	4:48	9:45	13
		5:12	4:51	10:03	
		4:51		4:51	
Bud Six	Albert Schmidt, Chicago, Ill.	D.N.S.		D.N.S.	3
		6:54	6:00	12:54	
		D.N.S.		D.N.S.	

Class 215—Distance 5 miles: last day 2½ miles: 2 Laps

Shirley Jane	M. J. Harkless, Harvey, Ill.	5:25	D.N.F.	D.N.F.	1
		D.N.S.		D.N.S.	
		D.N.S.		D.N.S.	
Miss Quincy	C. E. Padgett, Quincy, Ill.	5:51	5:01	10:52	2
		5:15	D.N.F.	D.N.F.	
		D.N.F.			

Class 320—Distance 5 miles: 2 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*Total*	*Points*
Van Dyke II	J. E. Walmsley, Evansville, Ind.	4:04	4:02	8:06	20
		4:02	3:54	7:56	
		3:54	3:56	7:50	
Ethel X	C. P. Hanley, Muscatine, Ia.	4:00	4:02	8:02	19
		4:00	3:57	7:57	
		4:06	4:19	8:25	
P. D. Q. VI	A. C. Strong, Evansville, Ind.	4:30	4:18	8:48	14
		4:22	4:35	8:57	
		4:42	4:22	9:03	
Margaret III	L. E. Selby, Pekin, Ill.	4:31	4:33	9:04	8
		4:34	4:30	9:04	
		5:26	D.N.F.	D.N.F.	
Miss Peoria	R. H. Daniels, Peoria, Ill.	4:51	4:48	9:39	8
		5:01	4:48	9:49	
		5:34	5:52	11:26	
Miss Illinois	Robt. Lee, Dubuque, Ia.	D.N.S.		D.N.S.	
		4:41	5:57	10:38	
		4:30	4:30	9:00	
Miss Quincy	C. E. Padgett, Quincy, Ill.	5:01	4:58	9:59	5
		4:55	4:49	9:44	
		D.N.S.		D.N.S.	

(*Continued on page 66*)

Baby Gar

World's Fastest Runabout

Twice Winner of Wood-Fisher Trophy Race

$8250 (Tax Paid)
50 Miles Guaranteed
Powered with 450 H.P. Liberty-Marine Motor (1550 cu. in.). This is the same power plant that has won all of Gar Wood's races and records during the past two years. Speed of 50 miles per hour guaranteed on 50 mile trial.

$7250 (Tax paid)
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Powered with 300 H.P. motor. (1350 cu. in.).

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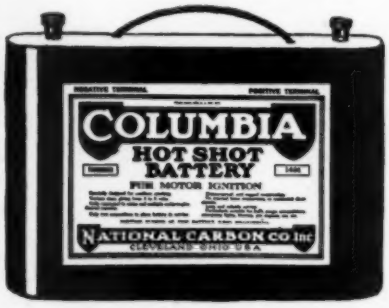

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The Columbia "Hot Shot" Ignition Battery yields its full power at starting—when your engine needs it most

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KANSAS CITY SAN FRANCISCO

Columbia Dry Batteries
—they last longer

Rare Sport at Chicago

(Continued from page 64)

Class 705—Distance 10 miles: last day 5 miles: 4 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*3rd Lap*	*4th Lap*	*Total*	*Points*
Peggy	Fred Schramm, Milwaukee, Wis.	3:22 3:24 3:26	3:26 3:20 3:25	3:20 3:18	3:30 3:21	13:38 13:23 6:51	16
Black Diamond	Barrick & Weber Peoria, Ill.	3:23 3:27 3:30	3:27 3:32 4:01	3:24 3:43	3:58 4:09	14:12 14:51 7:31	13
Meteor III	W. B. Wilde, Peoria, Ill.	D.N.S. 3:23 3:26	3:16 3:23	3:21	3:12	D.N.S. 13:12 6:49	12
Janet Virginia	Walter Plummer, Maywood, Ill.	4:15 4:19 4:18	4:06 4:15 4:09	4:11 4:14	4:21 4:18	16:53 17:06 8:27	9
Cecile	J. R. Gill, Peoria, Ill.	4:11 D.N.F. 3:54	4:02 5:03	4:04	4:05	16:22 D.N.F. 8:57	6
P. D. Q. VI	A. C. Strong, Evanston, Ill.	4:36 4:33 4:48	4:38 4:41 D.N.F.	4:42 D.N.F.	D.N.F.	D.N.F. D.N.F. D.N.F.	
L & R	Laughlin & Ruhaak, Peoria, Ill.	D.N.F. D.N.S. D.N.S.				D.N.F. D.N.S. D.N.S.	

Class 1300—Distance 10 miles: last day 5 miles: 4 Laps

Boat	*Owner*	*1st Lap*	*2nd Lap*	*3rd Lap*	*4th Lap*	*Total*	*Points*
Peggy	Fred Schramm, Milwaukee, Wis.	7:10 3:15 3:27	3:16 3:20 3:35	3:18 3:17	3:33 3:16	17:17 13:08 7:02	20
Oh Min	H. A. Parsons, Cleveland, O.	4:54 3:16 D.N.S.	3:11 3:11	3:05 3:08	3:08 3:07	14:18 12:42 D.N.S.	18
Badger Girl	F. Bailey, Peoria, Ill.	D.N.S. 3:29 3:17	3:17 3:19	3:17	3:15	D.N.S. 13:18 6:36	15
Betty Jane	L. Mert, Peoria, Ill.	D.N.S. 4:06 7:35	4:14 8:28	4:18	5:06	D.N.S. 17:44 16:03	11
Meteor III	W. B. Wilde, Peoria, Ill.	5:11 3:12 3:14	D.N.F. D.N.F. 3:18			D.N.F. D.N.F. 6:32	9
Bradley Teck	P. Becker, Peoria, Ill.	3:58 D.N.S. 5.46	3:41 D.N.F.	3:37	3:31	14:47 D.N.S. D.N.F.	8
Van Dyke II	J. E. Walmsley, Evansville, Ind.	3:59 D.N.S. D.N.S.	3:57	3:58	3:59	15:53 D.N.S. D.N.S.	7
Lady Racine	M. Draeger, Racine, Wis.	D.N.S. D.N.S. 4:03	4:04			D.N.S. D.N.S. 8:07	6
Cecile	J. R. Gill, Peoria, Ill.	4:10 D.N.S. D.N.S.	4:04	4:04	4:06	16:24 D.N.S. D.N.S.	2

Free for All—Single Engined Hydroplanes—Distance 15 miles: last day 5 miles: 6 Laps

Boat and Owner	*1st Lap*	*2nd Lap*	*3rd Lap*	*4th Lap*	*5th Lap*	*5th Lap*	*Total*	*Points*
Miss Chicago Sheldon Clark, Chicago, Ill.	2:26 2:52 2:53	2:25 2:58 2:54	2:25 3:30	2:25 3:26	2:27 3:17	3:03 2:53	15:11 18:56 5:47	20
Fore W. D. Fareman, Chicago, Ill.	2:48 3:01 3:04	2:46 2:54 3:02	2:48 3:25	2:47 3:26	2:52 3:19	2:51 2:54	16:52 18:59 6:06	16
Miss Dubonnet Chas. Ferran, New Orleans, La.	3:09 2:56 2:55	2:49 D.N.F. 2:57	2:48	2:44	2:49	3:04	17:23 D.N.F. 5:52	10
Baby Sure Cure Paul Strassburg, Detroit, Mich.	2:34 D.N.S. D.N.S.	2:25	2:25	2:22	2:18	2:32	14:36 D.N.S. D.N.S.	7
Badger Girl, F. Bailey, Peoria, Ill.	D.N.S. 4:28 D.N.S.	3:25	3:21	3:19	3:59	4:03	D.N.S. 22:35 D.N.S.	5
Century Tire C. J. Venn, Chicago, Ill.	D.N.S. 3:20 D.N.S.	3:36	3:53	4:10	4:01	3:49	D.N.S. 22:49 D.N.S.	4
Van Dyke II J. E. Walmsley, Evansville, Ind.	D.N.S. D.N.S. 4:13	4:04					D.N.S. D.N.S. 8:17	4
Bradley Teck Phil. Becker, Peoria, Ill.	D.N.S. 4:51 D.N.S.	D.N.F.					D.N.S. D.N.F. D.N.S.	1

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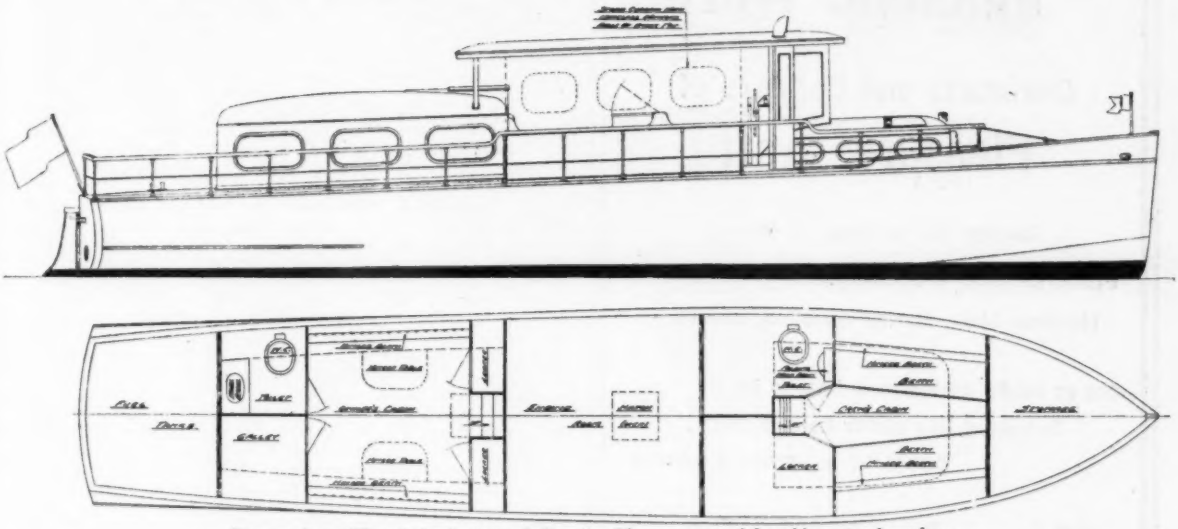
THE "Gar Jr. Flyer"

A New Standardized Guaranteed 30-Mile Commuter



Plan and profile of the improved Gar Jr. Flyer, a record breaking speed cruiser

Developed after the famous GAR JR II (shown below) (With Improvements in Profile, Deck and Internal Arrangement)

High Speed—Seaworthy
Dependable—Low Cost
Economical Operation

NEW YORK	Foot of East Twenty Third Street	to GREENWICH	55 Minutes
		" GLEN COVE	44 "
		" PORT WASHINGTON	42 "
		" OYSTER BAY	55 "
		" LARCHMONT	42 "
		" GREAT NECK	26 "
		" SOUTHAMPTON	4 Hours

Prompt Delivery

Now Available for Thorough Demonstration

Built By:—GAR WOOD, DETROIT, MICH.
Exclusive Sales Agents:—COX & STEVENS, NEW YORK

A 50-ft. twin screw motor yacht with sustained high speed, free of vibration, and remarkable seagoing qualities (as demonstrated by GAR JR. II in various long distance ocean races).

The hull construction is of highest grade (double planking—outer skin of mahogany). Fittings and furnishings of the best.

Power plant consists of two twin-six "Liberty" motors developing 450 H.P. each, perfect in balance and control, absolutely reliable, and practically automatic in operation.

A trained engineer will be furnished with each boat, and a guarantee from the builder as to speed and handling qualities.

For price, plans and full particulars, apply to

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Telephone: WHITEHALL 2700

Biscayne Yacht & Machine Works

Designers and Builders of

Pleasure Craft

Largest Marine Ways in Miami

Material and Workmanship Guaranteed

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Let us figure on that new boat to be Delivered this winter here in Miami Ready for a strenuous season

Miami, Florida

Prize Cups and Trophies

by

J. E. CALDWELL & CO.

PHILADELPHIA

have for years been awarded to the winners of some of the most important events on the country's calendar of sports.

Information Illustrations, Original Sketches and Approval Selections Promptly Forwarded

Southward with the Birds

(*Continued from page 24*)

blame that may be found necessary to place upon some shoulders, this being the accustomed procedure in human affairs. The crew was very small, at any rate: as small, as the ship was puny. Two made it up: a gentleman and a lady; that is, the lady. As a puny craft and a dual crew do not allow of much leisure, either in space or in time, it goes without saying that the lady had to share the labors of the gentleman: wherefore she took unto herself not only the housework duties, which, from time immemorial and until the colleges began to grant degrees in domestic science, have been considered as inherently feminine, but she assumed also the rôle of the steersman and sat at the wheel in fair weather and in storm. As occasion required, she performed other sundry work on board; witness the fact that she twice rescued the gentleman from the unpleasant situation into which he had put himself by incautiously walking off the ship into the cold waters, forgetful that Peter himself could not do such a thing without many misgivings and considerable help.

The gentleman was captain and engineer for some of the time: and man of all jobs the rest of the time.

When the outfit started (may I be forgiven the use of this singular war word, which may or may not be canonized by literary church of peace times), to the many inquiries that poured upon us from far and from near, we hastened to answer that we should be travelling by the inside route: and great was the satisfaction that such information spread about us, especially among the friends. The friends felt quite certain that no perils would threaten us on the inside route.

Most people know, even though they may be little interested in water travel, that there are two ways of reaching Florida by water from the North. One is the regular steamer way, the outside route, over the wide ocean, through winds and waves. It is the way of the true sailor, but it is utterly impracticable for a small boat. Aside from the relative danger of storms, a small boat cannot carry a sufficient load of fuel to keep it going for such a long distance; and, even if it could, since a craft at sea, like the humble citizen in a crowded city street, must keep moving, its diminutive crew could not stand the strain of a night and day watch lasting for weeks.

We, therefore, chose the other way, officially known as the inside or inland waterway, since it appears with such name in the documents of the U. S. Government, wherever there is mention of it. One should not, however, take it for granted that this route, because it is called inside, is as quiet as the millpond in the hills, where the canoeist woos while he paddles and the fisherman thinks up stories to tell while he waits for the bite of a government-raised bass.

Let us see. For the boatman that comes out between the jetties of the Connecticut River, the first part of a trip South is through Long Island Sound. A fair body of water, this, which the yachtsmen of all bordering and neighboring states have long since chosen as their playground. It can show bad moods, on occasion: a strong east wind, blowing in from the open Atlantic, can stir it into temporary frenzies, that can make things decidedly uncomfortable for small craft. But its storms are not frequent and the harbors whither the small boat can run for shelter—little, graceful nooks among rocks and meadows and woods—are so many along its indented coasts, north and south, that the Sound can be considered a friendly place and inside.

From the Sound, the traveler must enter the harbor of New York. There has been built a monumental gateway over Hell Gate, but the beauty of the arched railroad bridge has not changed the nature of that passage of evil repute: it is handsome above, but it is very bad under foot, so to speak. With a current that takes one's breath away and rocks that line the shores—when they do not stick up in the middle of the stream, as they do in the passages to the Harlem River—Hell Gate is likely to impress the beginner motor-boatman, and some of his more experienced brothers, as a kind of transplanted Styx (no reflection upon the city it encircles). There are worse places than Hell Gate along the Atlantic coast, but none with such an imposing *mise-en-scène*. It seems the unalterable decree of fate that everything must be in a swirl around New York, as well as within it. The East River rushes back and forth, and the Harlem rushes back and forth—it actually jumps under High Bridge—and the Hudson rushes back and forth, and one rushes up while the other rushes down . . . : It makes one giddy. The conclusion is, New York is a bad place for a small boat: the waters are in as much of a hurry as if they had to catch a subway train at every instant, and they are covered with a slimy coat of fuel oil that spoils that pride of a yachtsman, a glossy white coat of paint: moreover, there is no place to go. When the pilgrim traveler wanders about the harbor of New York in search of a spot to cast anchor, and sees big docks that are forbidden, and deep channels barred by law and pru-

(*Continued on page 70*)

Advertising Index will be found on page 146

BEAUTIFUL MIAMI

Plan now to spend your winter at Miami Beach. There is not a more ideal spot, either in the natural advantages of climate and surroundings or in the facilities for comfort and recreation.

Boating, bathing, fishing, golf, polo, tennis, and motoring are always in season. The sun shines at Miami every day of the year. It is warm in winter and temperate in summer.

While Miami's hotels are unexcelled in appointments and management, you will enjoy your winter home to the utmost if you build a permanent residence at Miami Beach.

Write today for details of plans, terms and available property.

CARL G. FISHER - - Miami Beach, Florida

New York Office: Hecksher Building, 730 Fifth Avenue

Motor Boatmen's Charts and Log Sheets

Published by MoToR BoatinG
119 West 40th St., New York

Charts printed on heavy cardboard 8½" x 11" and punched to fit standard loose leaf folder.

Contain name and location of all principal ports and harbors, distances, compass courses and sailing directions. Invaluable for use on small boats and motor yachts. The set now includes the following charts:

Series A

No. 1—Western End of Long Island Sound.
No. 2—Eastern End of Long Island Sound.
No. 3—Block Island Sound.
No. 4—New York Harbor.
No. 5—Boston Harbor.
No. 6—Buzzards Bay.
No. 7—Block Island to Vineyard Sound, including Narragansett Bay.
No. 8—Delaware Bay.
No. 9—Chesapeake Bay, Part 1, Upper Part.
No. 10—Coast of Maine, Portland to Rockland.
No. 11—Hudson River, Kingston to Albany.
No. 12—Chesapeake Bay, Part II, Central Part.

Series B

No. 13—Lake Erie—Eastern Part.
No. 14—Lake Erie—Western Part.
No. 15—Hudson River, New York to Kingston.
No. 16—Lake Champlain.
No. 17—Erie Barge Canal.
No. 18—Massachusetts Coast.
No. 19—New England—Newburyport to Portland.
No. 20—Cape Cod Bay.
No. 21—Maine, Monhegan to Eastport.
No. 22—Chesapeake Bay, Part III, Lower Part.
No. 23—Biscayne Bay.
No. 24—St. Lawrence River and Thousand Islands.

MoToR BoatinG's New Charts—Series C

The third series of MoToR BoatinG's popular charts begins with No. 25, which covers the Delaware River from Trenton to Philadelphia. Others in this series which follow will complete the route to the sea via the Delaware River as well as cover many interesting stretches of cruising waters on the way south and along the coast. It is planned to issue these about as listed below:

No. 25 Nov., 1921..Delaware River, Trenton to Philadelphia.
No. 26 Dec., 1921..Delaware River, Philadelphia to Smyrna.
No. 27 Jan., 1922..New Jersey Coast, Cape May to Little Egg Inlet.
No. 28 Feb., 1922..New Jersey Coast, Little Egg to Barnegat Inlet.
No. 29—March, 1922.New Jersey Coast, Barnegat Inlet to Sandy Hook.
No. 30 April, 1922.Chesapeake Bay, Smith Point to Cape Charles.
No. 31 May, 1922..Potomac River to Lower Cedar Point.
No. 32 June, 1922..York and James Rivers.
No. 33 July, 1922..Delaware Coast, Cape Henlopen to Chincoteague Inlet.
No. 34 Aug., 1922..Virginia Coast, Chincoteague to Cape Charles.
No. 35 Sept., 1922..North Carolina Coast, Cape Henry to Beaufort.
No. 36 Oct., 1922..Carolina Coast, Beaufort to Charleston.

Log Book

MoToR BoatinG has also published a log sheet to fit the standard 8½" x 11" loose leaf folder. Each sheet contains spaces for such data as time of passing various aids to navigation, names of aids, magnetic and compass courses, distances, patent log readings, speed of boat, revolutions of motor, wind direction and force, condition of weather and sea, depths of water, fuel, time of high and low water, etc., etc.

Prices

Charts 25 cents each or $1.50 per set of 12, 36 Charts for $3.50 (Series C will be sent as published). Log Sheets $1.00 per set of 50 Sheets.

Loose Leaf Binders (canvas bound) to hold Charts and Log Sheets, $1.75.

36 Charts, 50 Log Sheets and Loose Leaf Binder to hold Charts and Log Sheets, $5.00.

MoToR BoatinG

119 West 40th Street, New York

Southward with the Birds

(Continued from page 68)

dence, and shallow shores too much exposed to tide and wind, and restless currents everywhere, he feels like the poor negro that sings on the plantation:

"'De fox hab hole in de ground
An' de bird hab nest in de air
An' everyt'ing hab a hidin' place,
But we poor sinner hab none:
Now ain't dat hard trials, great tribulation?"

The Interstate Park has provided a little snug refuge beneath its high bluffs, and the clubs do the best they can to extend an often difficult hospitality to the passer-by: but New York is "hard trials", nevertheless—to enter, to stay around, to leave, New York Harbor is inside passage, unquestionably: in fact, it is a little too much inside.

When we left New York, a warm October morning, we had the last possible of all complications, a fog. To thread one's way down the Hudson, as it races to the sea, meanwhile to dodge tugboats and ferryboats, to scamper out of the way of steamers, to give all the available room to barges and tows, is bad enough; but to do it when one only half sees what is going on, makes the quarters look very narrow indeed. So it happens that one may find relief genuine by running into the Kills around Staten Island: they are quieter, at least, even though they seem to have gathered upon their shores all the foul-smelling plants that New York can boast of, and they are many.

The unmistakably inside route continues up the Raritan River and into the canal connecting the Raritan with the Delaware. One might wax enthusiastic about the rural beauty of the canal that winds its way past the back door of Princeton, and the quaintness of its hand-operated locks and its mule-drawn tows, and the women that man the turning bridges, and the general eighteenth century atmosphere that seems to have been left around it from the times when the canal boat was the best conveyance the country could afford. One could, if it were not for the memory of those seventeen dollars and sixty cents the ship treasury had to leave at the portals, that they might be opened. Alas for the toll! If, at least, it could be paid in shillings, it might appear more consonant with the looks of the canal; but not even that consolation is granted the romantically inclined yachtsman!

From Bordentown, below Trenton, where the canal ends, and all the way down the spacious Delaware, still bristling with the innumerable scaffoldings and inert cranes of the shipyards, alive two years ago with feverish life; and from the Delaware through the Chesapeake and Delaware canal into the Chesapeake, the inside route continues. By the way, the Chesapeake and Delaware canal is a free canal: the Federal Government bought it, some years ago, and presented it to the people: but, when the people try to pass through it, they discover that they must wait and wait and wait, no boat being allowed up a lock unless there is a boat that can, at the same time, be passed down: economy of water, we were told in the guise of explanation. May be: but it goes to show that there are advantages, as well as disadvantages, in paying for service more directly than through the general taxes. However, with a little patience, the Federal Government lets one into Chesapeake Bay: it lets one in in plenty of time to find out that things have changed, that side of the Mason and Dixon line: I mean, they have changed from the standpoint of the mariner,—not only from the point of view of the political observer, which does not enter here.

The yachtsman's awakening to the differing conditions, is bound to be prompt and rude. Chesapeake can be as good-natured and cheerful as a purring kitten, but it can be as vicious as a vixen, and it is not likely to stay in its kittenish mood long enough to enable a small boat to escape some of its vixenish viciousness. They may still call it an inland route, officially, but for all practical purposes it is wide, wide open: as much of an outsider as are the waters east of the segregated Maryland-Virginia Peninsula.

The trouble with Chesapeake is in its shape and its lay-out. The shape is like that of a pear, with the stem nicely fitting into the Delaware canal and the bulge in Hampton Roads. As it gradually widens, its receding shores grow lower and marshy and dim to the sight of the traveler: broad estuaries, like that of the Potamac and the York and the James River, and the innumerable fishing-stakes and nets cluttering the shallower parts of the Bay, force the small and the big boat alike, to keep well toward the middle of the expanding waters—and then they, the big one and the little one, are out of sight of land most of the time.

The lay-out is from north to south and offers a splendid sweep to any wind that chooses to swoop down from those quarters—quite enough to make matters lively upon any waters at almost any moment. But one may look for supplementary zest from other points of the compass. Those broad estuaries we have

(Continued on page 72)

Advertising Index will be found on page 146

SHADOW V

FOR SALE

SHADOW V *and* SHADOW VI

These two famous express cruisers are now in the market solely because the owner wishes to start construction on two new cruisers of similar type. Both boats are guaranteed in perfect condition in every detail of hull, power plant and equipment.

Both are 45 feet in length with twin screw 8-cylinder 5¾" x 7" Speedway Engines. The equipment is complete and each item is the best that can be purchased, including cushions, rugs, life-buoys, tachometers, extra stub shafts, extra wheels, compasses, tools, etc.

These boats cost about $26,000 each. The prices for which they will now be sold are actually less than the present cost of duplicating the hulls alone, without considering the cost of power plants and equipment. Price $16,500 each; delivery at Miami, Florida.

Shadow VI is practically new, having been driven about 500 miles. Speed 30 miles per hour guaranteed. This boat has a pair of glass wells beautifully installed in the bottom of the hull, making a particularly interesting boat for cruising in Florida waters.

Shadow V has had considerably more mileage but the engines have recently been thoroughly overhauled and are guaranteed in perfect condition. Speed 29 miles per hour guaranteed.

Write or wire for further details

CARL G. FISHER

HECKSHER BUILDING
730 FIFTH AVENUE NEW YORK, N. Y.

SHADOW VI

A REAL BOAT FOR REAL FISHERMEN

The MOTO-ROW $250

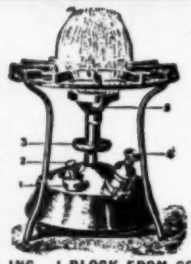
MAKE your vacation a real outing by owning a Moto-Row. Here is the greatest boat value ever offered—a combination power and rowboat of ideal design and construction for fishing, hunting and pleasure purposes, at less cost than an outboard makeshift.

Built of selected airplane spruce, copper riveted, and equipped with a dependable 2-H.P. motor protected from weather and theft beneath the stern deck, the Moto-Row offers you something distinctly new and practical. Dimensions 16 by 4 ft., speed 7 M.P.H., capacity six persons. Supplied with reinforced skeg, which permits beaching without injury to propeller. Salt water equipment $25 extra. Built by Sydney McLouth, Marine City, Michigan. Write for illustrated catalog.

BELLE ISLE BOAT & ENGINE CO.

Builders of Belle Isle Bearcat **Dept. B, Detroit, Michigan**

ZUNDEL



Genuine JUWEL Kerosene Oil Gas Stoves in stock. The original Juwel Stove made by G. Barthel, Germany. The stove has always been in great demand due to its extreme efficiency, simplicity and excellence of manufacture. Brass fount holds 1 quart; has detachable uprights. **Price $4.50. Postage prepaid.**

Zundel's Loud Sounding All Brass Marine Horn. Vibrator type, satisfaction guaranteed. Complete with push button and wire. **Price $10.00**

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BOAT SUPPLIES

DISAPPEARING PROPELLER BOAT

AN ideal runabout for your summer cottage. The Disappearing Propeller Boat operates in shallow water, runs safely over rocks and snags without injury to the propeller, yet is a sturdy, seaworthy craft with a large hauling capacity. Beautifully finished in natural woods. A boat for the family, one that will go anywhere that anybody can operate.

Illustrated literature showing Disappearing Propeller Boat in colors, complete description, etc., sent upon request.

DISAPPEARING PROPELLER BOAT CORPORATION
725 Main St. Dept. F Buffalo, N. Y.

Canadian offices: Toronto, Canada.

New York Representatives: Consolidated Shipbuilding Corp. Morris Heights New York

Southward with the Birds

(*Continued from page 70*)

just mentioned, and others we have not mentioned—like the Patapsco and the Patuxent and the Rappahannock, on the west side, and the Choptank, the Nanticoke, the Pocomico, on the east—leave the Bay exposed to flank blows from most unwelcome directions and of a most unwelcome character, beam winds from the west and from the east, either straight or hybridized with north and south strains. And, we need not say it, the spacious outlet of the Bay, which two British sovereigns, from their respective capes, graciously guard, allows without hindrance visitations from the obstreperous Atlantic. Under the circumstances, the navigator of cruising caliber is apt to learn that water is water for all that, whether it is inside of a bar or outside, as long as there is enough of it.

I remember the day we beat across Mobjack Bay. We were coming down from Little Bay, a cozy, tiny harbor near the mouth of the Rappahannock, where a storm had driven us for shelter and held us prisoners for three days. We had repleted our time of enforced rest with oysters—oh, the delicious blue-points just out of their beds!—and fish; and the hospitality of the canning factory with its solid docks was most enchanting: but, of course, neither oysters nor fish nor smiling hospitality could keep us in an instant after the sun shone again in the sky and the wind departed for other shores. So out we went, in spite of the warning doubts of the fishermen: storms have relapses, often,—they said. Storms have relapses: we found that out soon. By the time we had reached the Wolf's Trap, we were laboring along in a heavy sea that was as yellow, as if it had a bad liver, and there was a thick mist in the air, which a young wind of great promise was driving before it with blasts of penetrating chilliness. The wind was young, because it was coming from new parts: the storm just finished had hailed from the south-east and this one was blowing from the northwest: we did not think much of its youthful efforts and kept on. By the time we had reached Mobjack Bay and the mouth of the York River, however, the youthful efforts began to display such adult vigor, that we, in turn began to consider the advisability of seeking a harbor. Unfortunately there was no harbor easily accessible in those waters full of shoals and we were so far out from land that the nearest point to reach was the point of our destination, Old Point Comfort. So we ploughed on: the wind, a moderate gale, was full abeam: the waves were choppy and considerably higher than our boat; and we rolled and rolled and rolled in a continuous shower-bath of cold spray that sent the shivers to the marrow of our bones, in spite of oil-skins and thick woolens. Then, all of a sudden, the motor stopped. It always gives a pang to the motorist to have his motor suddenly refuse to perform what is supposedly its accustomed duty: but it gives more than a pang to have it expire, when its sudden death leaves him helpless to wallow in the trough of the waves or to shoot up to their crests, aimlessly, incoördinately, as if it were a creature whose intellectual light has been snuffed out with one stroke: it makes his heart sink into his boots.

An immediate investigation by the captain-engineer, revealed a new sensitiveness in that most sensitive and apparently irresponsible of all non-living organisms, the gasoline engine: it is susceptible to sea-sickness. I had never met it before: but, then, no human being exists who can claim that he knows by experience all of the tricks that a motor can play. The motor had been affected by the motion: the strong rolling had thrown the floating valve of the carburetor out of adjustment and, consequently, the gasoline was flowing freely, pouring in a steady stream into the bilge; and the motor, choked by such abundance of food, had sunk into the utter impotence of the seasick. To get it back to its normal health did not take long; a thorough cleaning out of the carburetor sufficing for the purpose: but during the rest of that heavy day, it had to be watched with affectionate care to see that renewed attacks of the odd disease did not reach the acute stage of a paroxysm. It is not pleasant—as everyone who has tried it, by choice or by chance, knows—to look after a motor that is troubled, when the boat rolls to such a point that the crew must stand, first, on the starboard side, and next, on the port side, and only incidentally on the keel. Consequently, all hands on board drew a deep sigh of relief when the ship finally came to anchor in the narrow, smooth Hole of Mother Hawkins, around the tip of Old Point Comfort. We were so comfortable, indeed, that we did not even care to remark on the blackened ruins of Hotel Chamberlin, where we had had some good times in the days of its glory. No, Chamberlin did not interest us a bit, even though its charred timbers disfigured the landscape of Fortress Monroe; we saw a bug-eye drop its anchor, close by, and its rakish rig, which rose strangely against the clear sky in the flood of light from a full moon just up in the eastern sky, charmed our eyes, as it swung gently on the faintest of swells. We went to sleep, as if the old Mother herself had cradled us.

Queer ship, the bug-eye! It is peculiar to the Chesapeake, and why it should be so, rather than otherwise, I know not: but it must be well suited to local conditions, or else it would not be. It is small and heavily built: it is narrow and sharp-sterned: it has little above water, except the flush deck, and it sports two masts tilted back at such an angle that they seem about to topple over. When it goes along with full wind astern, it has a way of spreading out its two triangular sails, one to one side of the ship and the other to the other side, that makes it look like a brooding hen. When one sees it from afar, one mistakes it for a lighthouse—the squatty lighthouse on stilts of the Chesapeake—and one becomes so accustomed to thinking it a lighthouse, that one ends by taking the lighthouses for bug-eyes,—and that is dangerous. Queer ships the bug-eyes: but they go. They even beat us, with all our stableful of horse-power, and they had nothing but the wind: ease of being at home, I suppose.

(*To be continued*)

Advertising Index will be found on page 146

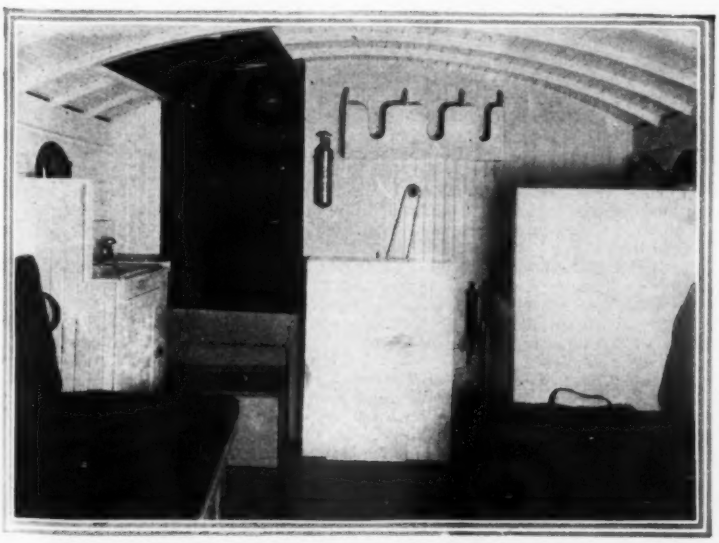
Richardson BOATS

All Aboard for Florida

"SCOUT"—The Richardson Standardized 26 ft. Cruiser. 28' x 8'6" x 2'6". Speed 9-10 M.P.H.

GET one of these wonderful little cruisers for your winter in Florida. Not only are they ideal for river or ocean cruising and fishing in Southern waters but they are also big enough, complete, seaworthy and fast enough for a party of four to make the trip South from any northern port in complete safety and comfort. There's plenty of room for eight or ten persons on day trips.

Scout is a well designed raised deck cruiser, complete in every detail, handsome, well built and economical to run. Large cockpit and roomy cabin with toilet, galley and berths for four. Full headroom inside. 4 cycle 12 H. P. motor gives 9-10 M. P. H. The ideal one-man cruiser, easy to handle and safe in any weather.



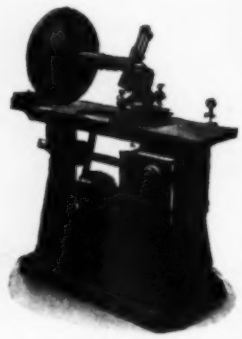
If you prefer a larger boat we can build it for you at the lowest cost consistent with good workmanship. Our location gives us a big advantage over other builders in labor and material costs. We also specialize in K.D. frames for boats of all sizes and types.

Write today for complete details and prices on Scout or quotations on any other size boat you want.

Order now for Fall delivery

Richardson Boat Co.

370 Sweeney St., No. Tonawanda, N. Y.



Lack of Balance May Result in Annoying and Destructive

Vibration

Every marine motor should be accurately balanced on an NWA Balancing Machine, before it is installed in the craft. By balanced, we mean that the flywheel and crankshaft should be put in perfect dynamic and static balance.

This accomplished, there is little danger that the engine will cause annoying vibrations.

This service should be given every boat purchaser by the engine builder. If it was not thus taken care of, we can correct the difficulty, in our laboratory.

Send for Booklet "Eliminating Vibrations"

WE SOLVE VIBRATION PROBLEMS

Trade Mark Registered

VIBRATION SPECIALTY COMPANY

N. W. AKIMOFF, President

Harrison Building **Philadelphia, Pa.**

A Likely Story

(*Continued from page* 16)

He reeled in and landed a silvery fish of some five pounds' weight. As it still struggled on the hook I seized the moment to bring my camera into play.

"Don't waste your film on him," said Ben. "He'll look like a sunfish before the day is over."

But I have been taking pictures too long to miss any chances. Many years ago I had an opportunity to get a first rate view of an alligator sunning himself on a river bank in Florida. I passed it up because the 'gator was only eight or nine feet long. Since then I have never seen another one. So I feared to tempt fate by neglecting this jack. While Ben held it up and hid his face from very shame behind the mizzen mast (as the accompanying picture reveals) I snapped it.

After this there were no more strikes and I improved the occasion to inspect the banks of the Chagres with some particularity. The river at this part is much the same as it was in the days when Captain Henry Morgan and his band of buccaneers captured Fort Lorenzo and paddled up the muddy stream to cross the isthmus and lay Panama City low. Heavily matted vines clamber over the towering trees, slowly strangling them so that they may die and make room for the younger vegetation. Orchids bloom high in air and lianas connect upper and lower branches in a network of fantastic pattern. Cocoanut palms lean over the water and at wide intervals the dark shimmery green of the mango tree distinguishes itself from the surrounding verdure. Beneath these trees the ground is smooth and bare, for no cocoanut or mango has a long lease on life when the natives can get at it; but elsewhere the underbrush is dense, and a view into the jungle is restricted to three or four yards.

We had picked a bright day for our excursion, and in the mellow sunlight the prospect was most pleasing. Crane and heron wheeled away as we motored up the stream, but of smaller life there was none visible or audible. I imagine that it was on such a day as this that the Spaniards first landed and believed that they had discovered a New World paradise. But in those days as now the malarial mosquito lurked in the long grass waiting for darkness to fall, and in those nights as now Chagres fever was a plague that laid the strongest low. If our motor failed along this deserted stream we would be marked for sickness as surely as the pioneers were.

However, it chugged away, the vegetation on the banks cutting up the echo of the exhaust into a gentle swishing sound, and before long we rounded the last of a dozen hairpin turns and brought civilization and Gatun Dam into view. Soon between two islets in the river we glimpsed the tremendous spillway, and Steve exclaimed:

"Now this is the best spot in the river for tarpon. Best in the whole world, for that matter."

But still we had no strikes. Ben explained that the fish were sluggish because the spillway gates were closed and there was relatively little water in the river. Nevertheless he shared the optimism of all of us, and when we had gone as far as the depth of water permitted, we headed about and trolled slowly down the stream.

Still no strikes, and it occurred to me that here would be an ideal situation for the railroad owners and workmen to adjust their difficulties. They could occupy the midriver islands in peace and quietude and let the strike question be handled by the tarpon. If, however, they wrangled among themselves, Uncle Sam would be in an opportune position to open five or six gates of the Gatun spillway and drown their discordant voices in the roar of angry water. This novel idea was suggested to me by the presence of several apathetic negroes lounging under crazy shacks on the islands, and I unlimbered my camera to preserve them for posterity. As I did so the motor coughed from lack of nourishment and stopped.

Leaving my picture untaken I dived below, and when the engine was primed and started we headed once more up stream, the anglers still angling with all the patience of their kind. Again I trained my camera on the natives, who, like the inhabitants of volcanic islands, live on the brink of eternity. Again the motor coughed consumptively, and again I dropped below to adjust the mixture. When the identical thing had happened a third time I gave up my photographic effort and once more turned my attention to the fishermen.

Up and down we trolled, over the best fishing grounds in all the world. But still we had no luck. Presently Ben spoke.

"The fish aren't biting," he pronounced laconically.

I started guiltily. Having long since come to the same conclusion I felt that my cursed luck was keeping the fish from the spoons.

"Shall I step ashore?" I asked. "They never do bite when I'm around.

"No," said Ben magnanimously, "it isn't your fault alto-

(*Continued on page* 76)

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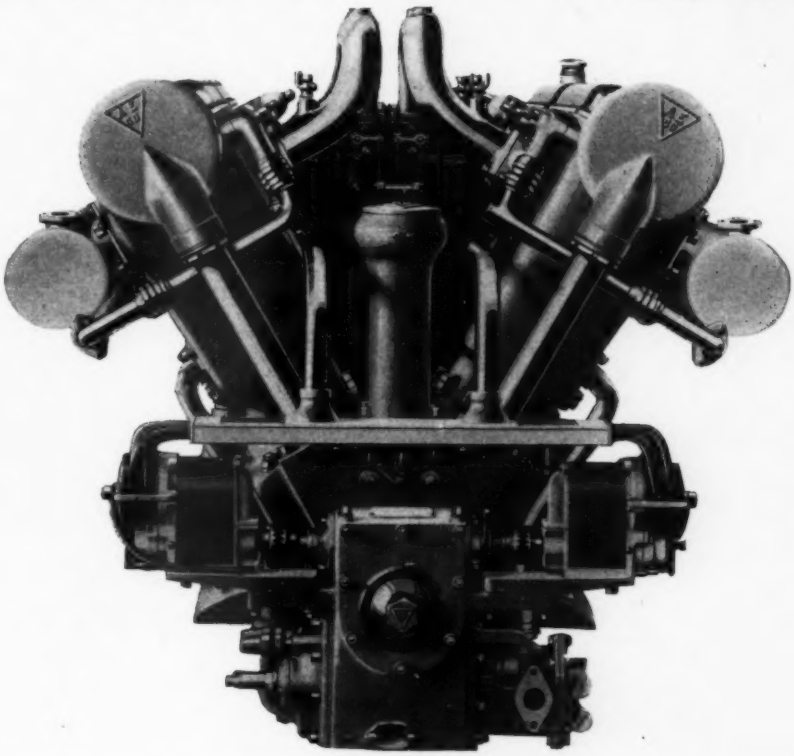
ALLISON

The Masterpiece of Marine Motor Engineering



A twelve cylinder 60 degree V-type marine power plant designed particularly for single and twin-screw installations in motor yachts, express cruisers and the larger high speed runabouts. Develops 300 H.P. at 1000 R.P.M., 425 H.P. at 1500 R.P.M.

A few years ago a committee of the foremost automotive engineers settled upon a twelve cylinder V-type engine as the best possible contribution of American designers for winning the war. The Allison Twelve is an engine of approximately similar type and size but is designed from the ground up for marine purposes exclusively.

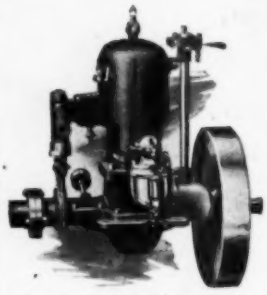
The Allison is built for the yachtsman who can afford the best. Its price of $25,000 is based on the actual cost of production. A study of Allison design, observation of Allison manufacturing methods, noticing the infinite care devoted to the production of each part of each motor, readily explains the cost and the service value of the Allison.

Catalogs sent on request to possible purchasers.

ALLISON ENGINEERING COMPANY

INDIANAPOLIS INDIANA

LOCKWOOD-ASH
MARINE LA ENGINES



For small power boats

Simplicity, light weight, easy starting, absolute reliability—for eighteen years these qualities have commended L-A two-cycle engines to the expert engine man and to the amateur alike.

Prices range from $77.50 to $144.00. Write for complete description and specifications. Convince yourself that L-A two-cycle engines are suited to every need for ideal small boat power.

Model 24, 1-cylinder, 2-cycle. Two sizes—2½ H.P. and 4 H.P.

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2207 Jackson St.
Jackson, Mich.

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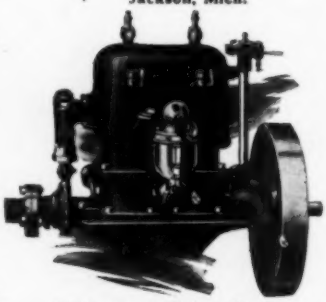


Model 6B, 2-cylinder, 2-cycle. Two sizes—6 H.P. and 8 H.P.

96

Let the
BOYCE MOTO METER
watch your hidden motor

It reveals instantly weeds in the water-inlet, a clogged pump and other causes of overheating damage.

It enables you to regulate your motor temperature to secure maximum gasoline mileage.

Price $18.00
Write for Booklet

THE MOTO-METER CO., INC.
LONG ISLAND CITY NEW YORK

A Likely Story

(Continued from page 74)

gether. They hardly ever bite when the spillway gates are closed."

"Well," I declared, "it seems to me that we chose a poor psychological moment for fishing."

"No," interjected Steve. "It's this way. If the gates were open the Hippo would barely make the grade against the current. We could catch tarpon when we got here, but we'd never get here. The way it is now with the gates closed we are here, but we can't catch tarpon."

"Then," said I, "let's call it a day."

Slowly I directed the little Hippo's nose toward a ramshakle landing on the east bank of the river, and when she had shoved her bowsprit into the heavy grass some one carried a line ashore and made her fast. On the bank we saw tarpon scales in hundreds, but from other apathetic negroes, lounging under other huts, Ben learned that the tarpon would not bite until after five o'clock. The climax of our fishing expedition had come and gone unnoticed with the catching of the five-pound jack, and I knew as I should have known all along that no varnished tarpon would adorn the walls of my prospective trophy room.

So without further ado the members of our party who live on the Pacific side of the isthmus left us to catch the return train at Gatun, and we of the Atlantic side hauled the dinghy aboard and headed down stream. Over the starboard quarter of Hippocampus we waved a regretful farewell to fish and fishermen, and made ready for a rough passage. It came.

As we rounded Fort Lorenzo the trade wind struck us with its midafternoon ferocity, and I commenced to wonder, as I have wondered before, why I like the life on the ocean wave. Being across the bar we hoisted sail and headed on a long starboard tack directly out to sea. The Chagres dwindled into the distance, but the effect of its outrushing fresh water followed us, and in the ugly chop of the tide rip I met my Waterloo. For the first time in more than three thousand miles of Hippocamping I lay on the lee deck and took the count.

It is a shameless admission to make, but for more than an hour while we left the Spanish Main behind us I hadn't the ambition to give the main throat halliards the final tug that would flatten the luff of the sail against the mast. Bert and Steve, and even Steve's son Bobbie, who had come along in the official capacity of onlooker, kept their health and spirits, but I was practically so much dead weight on the deck of my cherished yawl.

Then, when the jetty light tower had been brought to bear over our starboard quarter we came about and started a reach to harbor. With the change in course came a change in my condition, and at Bert's request I relieved him at the tiller. Talk about fish that telephone to a man! Here was a boat that telegraphed to me through her rudder! The message came not in fish or Continental code, but in plain, straightforward English, vibrant with life.

"You're not sick. You're sailing the sweetest little yawl that ever dipped her bowsprit to the plunge of the Northeast Trade. Watch me dodge that big one and make a rod to windward in the smooth that follows it. See me flush my lee rail, and feel me tingle with the joy of motion."

Yes, sir. That's what the tiller said, and I understood again why I like the sailing life. This slight indisposition of mine had been caused by something that I ate for breakfast, if it had not been entirely a figment of the imagination. I was a well man and a sailor. Let tarpon fishermen troll stupidly back and forth over fish that pay them no attention; but give me a pounding sea and a tossing boat whose heart of oak beats in unison with mine.

So I thought as we ran our course and gained the entrance to the harbor. And so I still think, now that our unsuccessful fishing expedition is a thing of memory. If, at some remote date, the fish, tarpon or otherwise, consent to bite, I may enjoy fishing, but I know without perhaps that for as long as canvas draws or a motor turns I shall enjoy the sport of sailing.

Big Yachts Use Fine Searchlights

In line with the policy of the firm in only specifying high-grade equipment throughout on all boats designed under their supervision, Messrs. Cox & Stevens, the New York naval architects who have just completed the large Diesel powered yachts Caritas and Dolphin, have included in the electrical equipment on these vessels the high capacity searchlights as made by the Carlisle & Finch Company of Cincinnati, Ohio. Searchlights manufactured by this company are adapted for every service. Arc lamps are used for the type operating on 110-volt current. The lower voltage lamps employ incandescent bulbs of suitable voltages to meet the requirements. They come in all sizes from a small one with a seven-inch lens to a monster with a sixty-inch lens. These lenses are carefully ground from a special grade of glass.

Advertising Index will be found on page 146

Hacker-Craft

"HACKER-COMMUTER"

Double Cockpit—30'6" x 6'6". Controlled in forward cockpit. Seats five comfortably in forward cockpit, and five in aft cockpit. Powered with Hall-Scott and Sterling Marine Motors. Speed up to 37 real miles an hour. You may COMMUTE from six to nine months of the year with this outfit. Go anywhere, anytime. Positively the best high-class commuter proposition ever offered. *Send for particulars.*

Special Outfits

Now is the proper time to get started on your special boat for next year. We are prepared to figure with you on any kind of a high-class runabout, sedan or limousine proposition. Speeds guaranteed, and Hacker-standard thruout. Will furnish Prints, Specifications and Price upon knowing exact requirement.

WE ARE THE LARGEST EXCLUSIVE BUILDERS OF HIGH-CLASS RUNABOUTS IN AMERICA

HACKER BOAT COMPANY

1525 CRANE AVENUE DETROIT, MICHIGAN

FACTORIES: DETROIT and MT. CLEMENS, MICHIGAN

Send for the Hacker Book of Plans. Brimful of Up-to-Date Designs

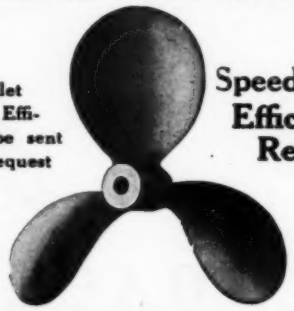
WE congratulate the Gordon Boat Building Co., upon this new cruiser that has already won the admiration of motor-boating enthusiasts. And we assure them that the **Tiebout Hardware and Fittings** used throughout will give enduring service worthy of this splendid craft.

W. & J. TIEBOUT

116 Chambers St. New York

HYDE TURBINE TYPE PROPELLERS

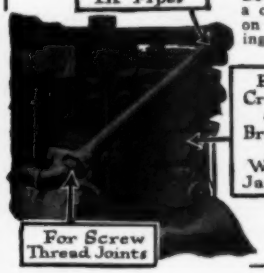
Our booklet "Propeller Efficiency" will be sent free upon request



Speed
Efficiency
Reliability

HYDE WINDLASS CO., Dept B, Bath, Maine, U.S.A.

SMOOTH-ON



EVER THINK OF WHAT MIGHT HAPPEN WHILE ON A CRUISE?

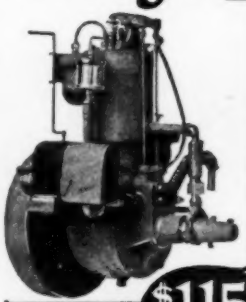
Be prepared to meet emergencies—keep a can of Smooth-On Iron Cement No. 1 on board for quick, economical and lasting repairs around the engine.

Smooth-On has many uses around motor boats, etc.—send for our Motor and Home Repair booklet, illustrating and describing numerous repairs that can be made with Smooth-On. It's FREE—write for it.

Smooth-On is sold in 6 oz., 1 lb. and 5 lb. tins by supply houses. Also in larger sizes.

SMOOTH-ON MFG. CO.
Dept. 24-I
Jersey City, N. J., U. S. A.

Michigan Marine Motor



REPAIRS WITH FORD PARTS

MORE power, greater dependability, less weight, longer life, easier repairs, and lower cost—six salient points which make the Michigan Marine Motor the logical power equipment for your boat. Parts and repair service available at any Ford garage in the world.

Michigan Marine motor develops 4 h.p., weighs 125 lbs., is of 4-cycle type, and is fully guaranteed for one year. Equipped with Bosch Magneto and Impulse coupling $20 extra. Built by Michigan Marine Motor Co. Write for special offer.

$115

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Builders of Belle Isle Hydrocar
9063 E. JEFFERSON AVE., DETROIT.
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14' "Marybelle" And Other HACKER

Designs Appearing in MoToR BoatinG

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RAILWAYS — OVERHAULING — STORAGE

The Compass For Your Boat

should be the best obtainable. For seventy years Ritchie compasses have been the choice of experienced navigators.

Select the Ritchie for your boat.

Our catalog will show you the one best suited for your needs. Send for a copy today.

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Established 1850
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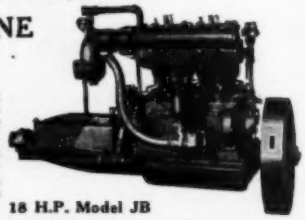
GREATLY REDUCED PRICES

Established Twenty-two Years

REGAL MARINE ENGINES



LOWER manufacturing cost enables us to quote much lower prices for REGAL four-cycle engines. Made in sixteen sizes, one to eight cylinders. Weights from 135 pounds to 8500 pounds.

18 H.P. Model JB

REGALITE ¾ kw. air cooled lighting plants for homes and boats. Write for catalogue.

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He Knew What a trim, stanch, rot-resisting craft his would be if she was

A CYPRESS BOAT

so, naturally he had her built of CYPRESS.

TIDEWATER CYPRESS, "the Wood Eternal," is identified by the CYPRESS trade-mark "arrow." Please write us immediately if you can't find it.

Southern Cypress Manufacturers' Assn.
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Advertising Index will be found on page 146

PURDY BOAT COMPANY

Designers and Builders of

EXPRESS CRUISERS

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YACHTS -- CRUISERS -- HOUSE BOATS

Experience Teaches—Hence the reason that once an owner of a New York Yacht Launch and Engine Craft always an owner. Many years' experience in high class Yacht Design and Construction are at your service.

20th CENTURY MOTORS

400 to 500 R. P. M.
Heavy Duty Type
Four cycle. Bore 6½",
Stroke 8"

2 cyl. 15-20 B. H. P.
4 cyl. 40-50 B. H. P.
6 cyl. 65-75 B. H. P.

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Racing Hydroplanes—Special High Speed Runabouts

75-85-95 AND 100 M. P. H. BEEBEE DESIGN 40-50-60 AND 75 M. P. H.

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We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel, Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.

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"Have run my Barker Motor thirty thousand miles in ten years and it is good for ten years more."—Name on request.

Built for long service—New low prices in effect

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Famous Racing and Cruising Yachts in every country are equipped with our spars. Hollow and solid Marconi Masts, Brass fittings—Rigging work, Brass track and Slides

PIGEON HOLLOW SPAR CO., East Boston, Mass.

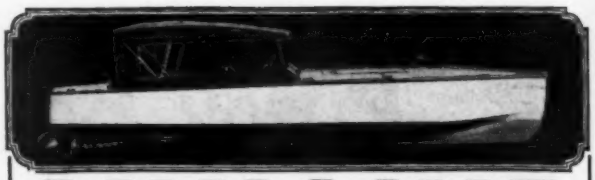
Built by

LUDERS

The Last Word in Yacht Designing and Building

Luders Marine Construction Company

Stamford, Conn.



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STEEL BOATS CAN'T SINK

Read about the Mullins "V" Bottom—fastest, safest, finest boat of its kind. Write for big, new, illustrated catalog, describing Mullins power boats, rowboats and canoes. Send post card now.

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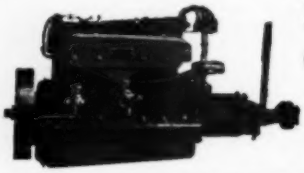
12-16 H. P., 4 cyl., 4 cyc.

FORD REPLACEMENTS IN STOCK EVERYWHERE

Write today for details, specifications, prices, equipment and name of nearest dealer. We also build 2 cycle motors 1½ to 8 H.P., famous for 26 years.

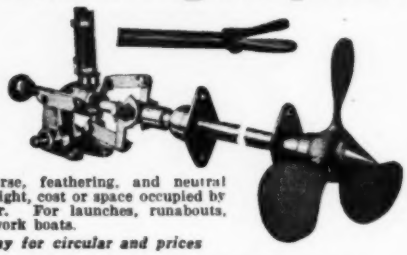


C. N. CADY CO., Inc.

304 Centre St.,
Canastota, N. Y.

Established 1883

The Gordon Reversible and Feathering Propeller



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Designed by a competent architect, constructed by master boat builders and finished throughout like a high grade yacht, The GRAY BOAT is everything you could desire in a cruiser of its size. Beauty, comfort, pleasure, safety, convenience, roomy accommodations and class. Sleeps four inside, full headroom, light ventilated cabin separated from motor, toilet, folding basin, galley, stove, refrigerator, ample locker space, large cockpit. Absolutely complete cruising equipment.

De Luxe Model, mahogany finish, brass fittings. **Practical Man's Model,** oak finish, galvanized fittings.

Powered with Fay & Bowen LN-41, 16 H.P., Speed 9-10 miles per hour.
Powered with Fay & Bowen LN-42, 30 H.P., Speed 11-12 miles per hour.

Write for prices.

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An Absolutely Reliable Gear

is a big factor in the satisfaction you derive from your motor boat. And absolute reliability means nothing less than a Johnson Gear.

Made in six sizes, from 1—100 H.P.

Write Department 25 for our Catalog.

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Electric Searchlights

ARC OR INCANDESCENT

A Searchlight for any purpose. Arc Searchlights for 110 volts. Incandescent Searchlights for low voltage. In sizes from 7 inch to 60 inch. High efficiency. Moderate price. Special glass mirror. Sturdy cast bronze fittings.

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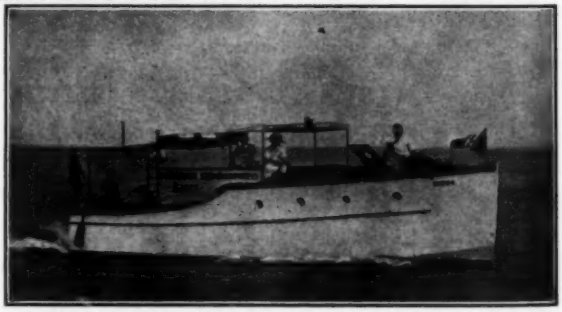
HARRISON 32

"One of the finest Cruisers afloat."



Built in Single and Double Cabin models. Motor 40 H.P. Speed 12 M.P.H. The price of $4800.00 guaranteed to July 1st 1922. Illustrated literature sent on request. Established 1897

R. W. HARRISON BOAT WORKS

Bay View Park, Toledo, Ohio

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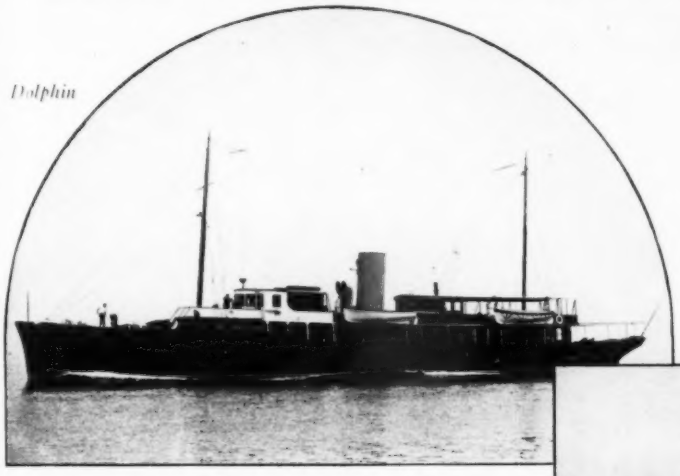
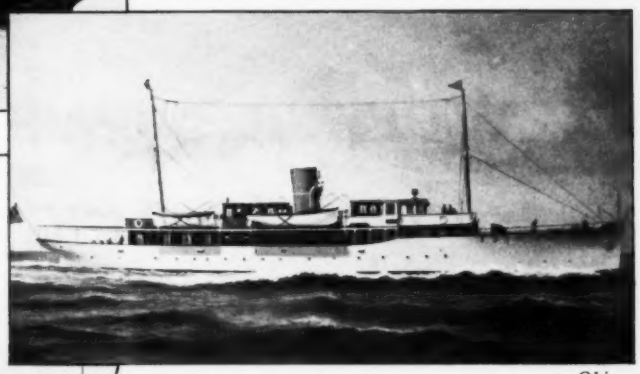
THE facilities and abilities of COX & STEVENS are best shown by the class of yachts designed by this company and built under our supervision.

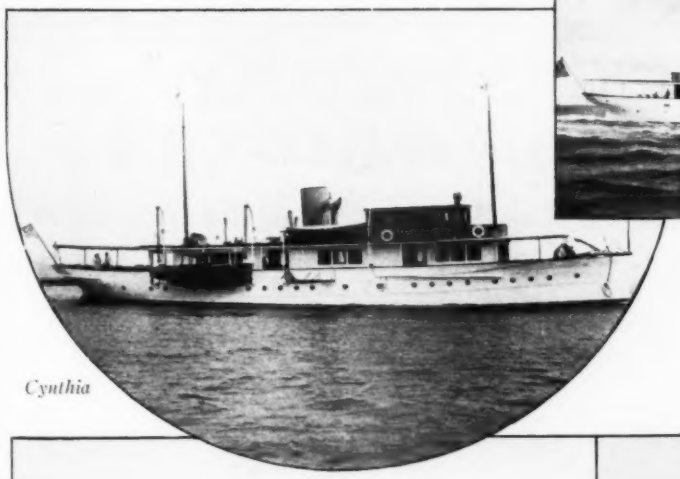
Our clients have at their disposal an unequalled experience in the design and construction of steam, Diesel and gasoline yachts.



Dolphin

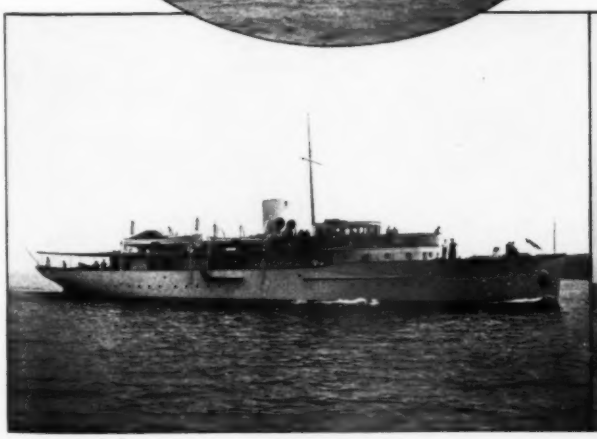


Ohio

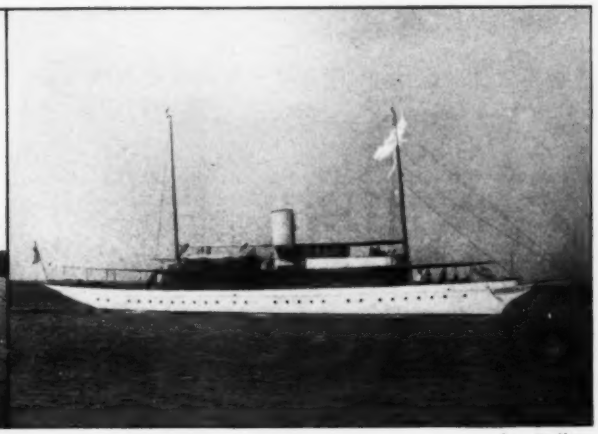


Cynthia

Dolphin—180 ft. built 1922 for Mr. Mortimer L. Schiff.
Ohio—178 ft. now under construction.
Cynthia—129 ft., built 1922 for Commodore Merrill B. Mills.
Nourmahal—160 ft. built 1921 for Mr. Vincent Astor.
LaBelle—130 ft. built 1911 for Mr. Alexander Winton.



Nourmahal



La Belle

We invite correspondence from yachtsmen interested in building, purchasing or chartering a yacht of any size.

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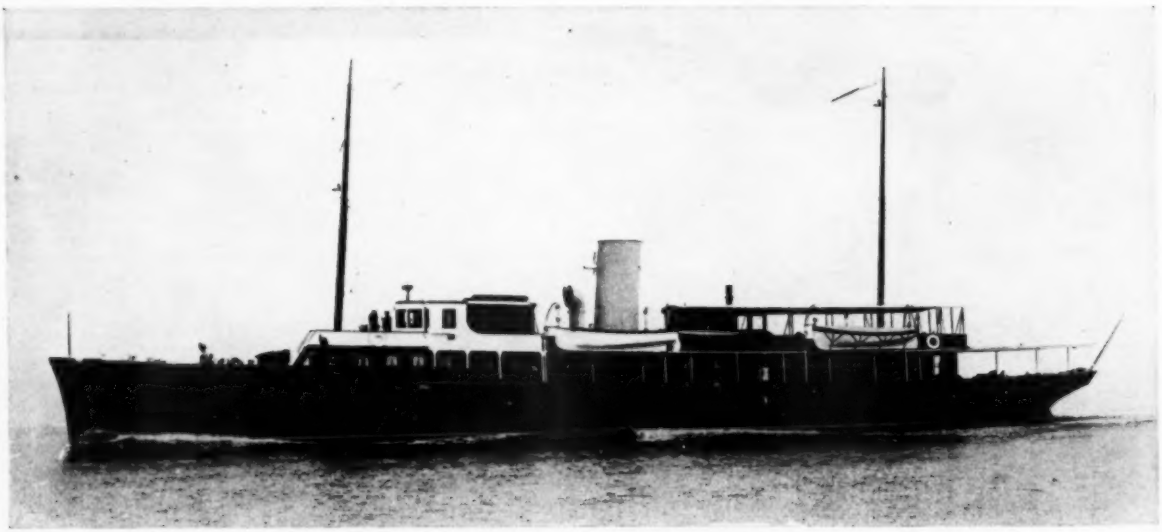
AND
DRY DOCK COMPANY
YACHT AND SHIPBUILDERS



SEAGOING DIESEL YACHT DOLPHIN
BUILT BY US

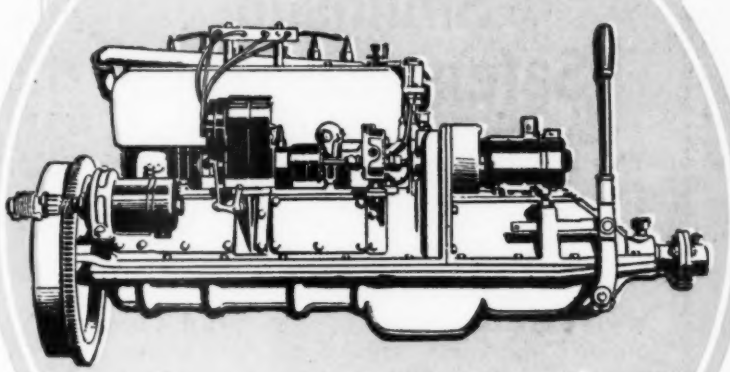
Owner, MORTIMER L. SCHIFF, N. Y. Y. C. Designed by COX & STEVENS

Plant Located at Newport News, Va., on Hampton Roads

NEW YORK OFFICE—WOOLWORTH BUILDING—233 BROADWAY

Advertising Index will be found on page 146

KERMATH



No one will question the quality of the yachts produced by Cox & Stevens, or of the parts and materials selected for their equipment.

The Kermath has been used to power the tenders of many Cox & Stevens boats, including the Dolphin, Cynthia, Caritas, Nourmahal and others.

It is simply another expert recognition of Kermath quality, the same recognition that has made Kermath the biggest selling marine engine in its class.

Have a Kermath in your boat.
You'll find it right in design, construction, price and service.

Seven models—3 H.P. to 40 H.P. All four cycle engines, one, two and four cylinders.

KERMATH MANUFACTURING COMPANY
DETROIT 5880 Commonwealth Ave. **MICHIGAN**

Smithson Safety Porthole

Nothing but the best went into the "Cynthia." That is the reason the designers specified the Smithson Safety Porthole. It costs more but it has the factors of value behind it demanded by all discriminating designers and owners.

Built only of the highest grade materials, precisely machined and fitted; when closed it is absolutely watertight without use of spanner or key, and as dependable as the hull to which it is attached.

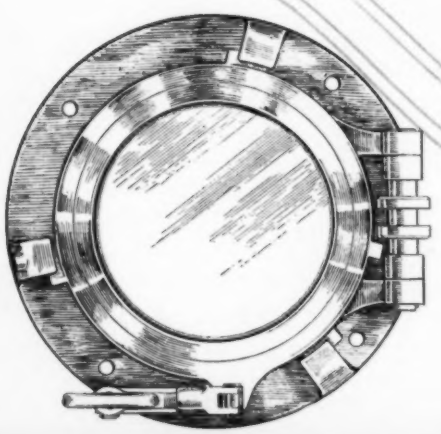
Furnished in all sizes and to specifications

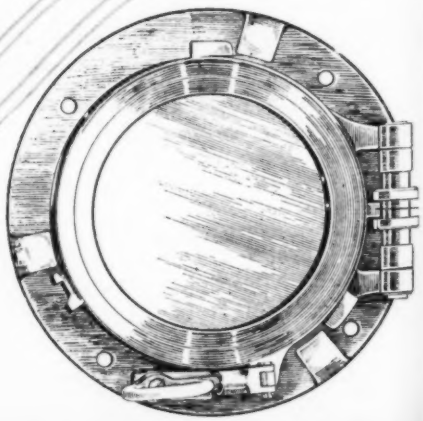
Other recent intallations

Goodwill	Mr. Keith Spalding
Corsair	Mr. J. P. Morgan
Analgia	Mr. Louis E. Pierson
Elise II	Mr. Frank B. Bower
Ida	Mr. Victor A. Searles

Write today for descriptive literature

MERCANTILE SPECIALTIES CO.
11 Broadway, New York, N. Y.





CYNTHIA

built by the

TEBO YACHT BASIN CO.

Many examples of America's best effort in yacht design and construction have sprung into being in the Tebo Basin.

Arrangements may now be concluded for storage, repair, or reconstruction during the fall and winter season.

With facilities that are unsurpassed for the largest or the smallest job, Tebo has earned a reputation for yacht construction, reconstruction, and repair that is nation wide.

Our designing engineers and construction experts will be very glad to cooperate with owners desiring repairs or reconstruction, and render expert advice concerning possible changes together with costs, length of job, etc.

TEBO YACHT BASIN COMPANY
(PLANT)

TODD
NEW YORK, U.S.A.

FOOT OF TWENTY-THIRD ST. BROOKLYN, N. Y.

CRANKSHAFTS

THE crankshafts of Winton Diesel Engines are forged and machined complete for the Winton Engine Works by the National Forge & Tool Company.

These crankshafts are forged from special alloy steel at a uniform temperature, annealed and heat tested, then machined by expert workmen and subjected to severe inspection.

We specialize in forging crankshafts for Diesel Oil Engines and our equipment is splendidly adapted to this highly technical work.

In addition to the department handling these big forgings, we of course continue to operate our forging department for smaller crankshafts, where our production facilities are very large.

Full details concerning our facilities will gladly be supplied on request.

NATIONAL FORGE AND TOOL COMPANY

Irvine, Warren County, Pa.

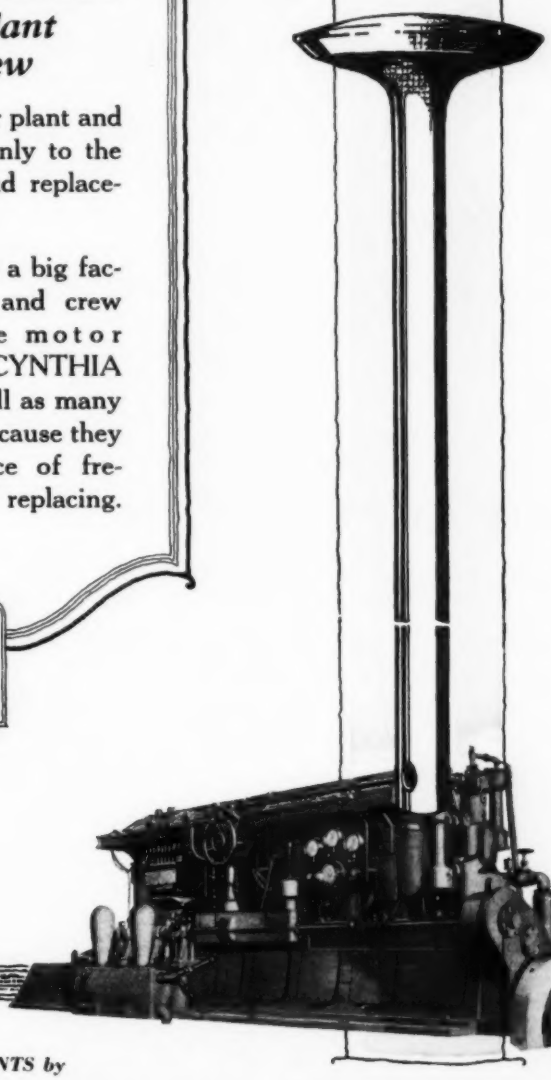
Advertising Index will be found on page 116

Nichrome Valves

For Compactness of Power Plant and of Crew

Compactness of power plant and of crews is possible only to the extent that repairs and replacements are eliminated.

Nichrome* Valves are a big factor in power plant and crew "compactness" of the motor yachts DOLPHIN, CYNTHIA and CARITAS, as well as many other motor ships—because they eliminate the nuisance of frequent regrinding and replacing.



** Nichrome is the registered trade mark name applying solely to alloys made by the Driver-Harris Co.*

Manufactured under PATENTS by

DRIVER-HARRIS COMPANY

HARRISON, NEW JERSEY

CHICAGO DETROIT CANADA ENGLAND FRANCE

Winton

DOLPHIN

Length 180′; Beam 24′; Speed 15 Knots

Cruising Radius: 6000 miles

Owner: Mr. Mortimer L. Schiff, New York

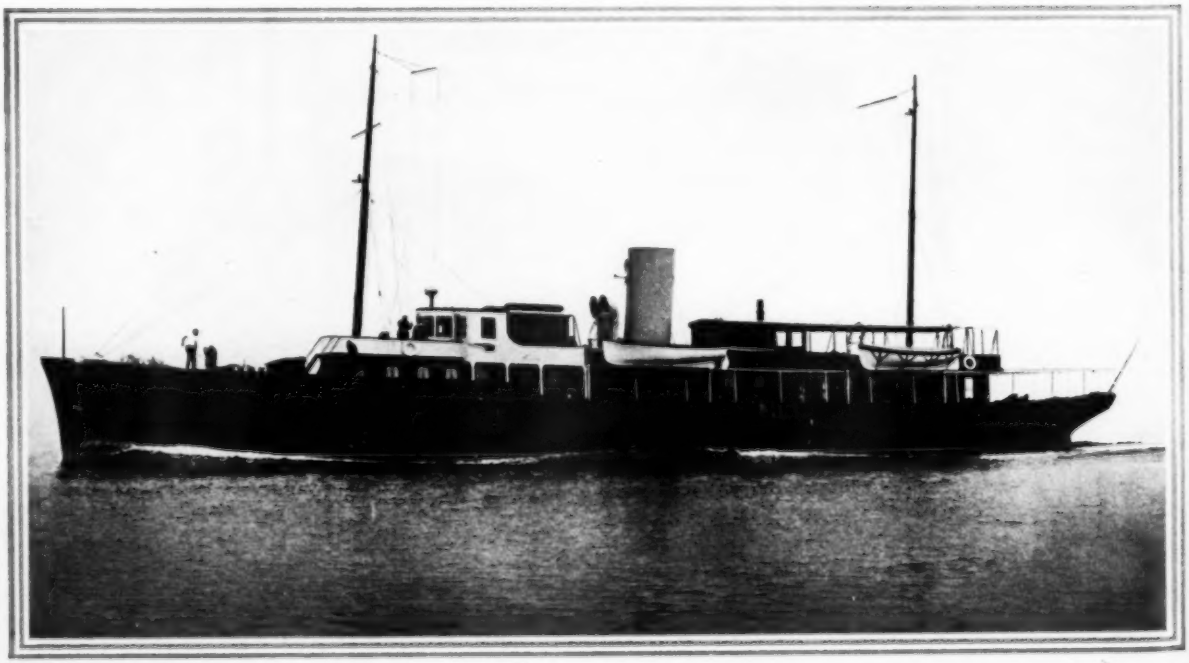
Designers: Cox & Stevens, New York City

Builders: Newport News Shipbuilding & Drydock Company

Power Plant: A pair of eight cylinder Winton Diesel Oil Engines rated at 550 H.P. each, designed and built by the Winton Engine Works, Cleveland, O.

Winton Engine Works Cleveland, Ohio, U...SA

NEW YORK CITY: A. G. Griese, Inc., 30 Church St. NEW ORLEANS: A Baldwin & Company
WASHINGTON, D. C.: R. L. Fryer, 817 Albee Bldg. LOS ANGELES: F. G. Bryant, 704 Delta Bldg.
SEATTLE: H. W. Starrett, Sunset Engine Co.



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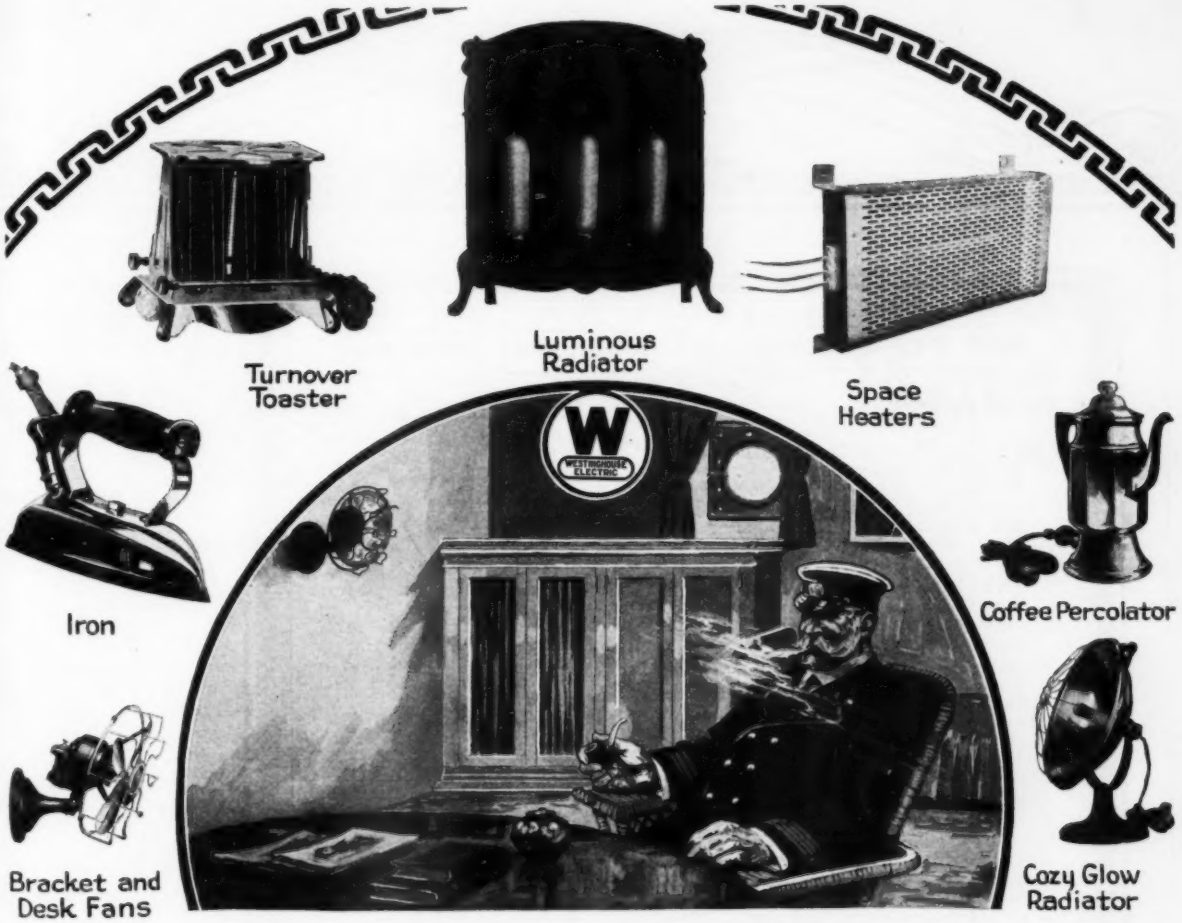

Home Comforts Aboard Ship

IT is only necessary to compare the ship of today with the ship of yesterday to see the big advance that has been made in the matter of electrical conveniences on shipboard.

Electrical appliances that formerly were found only in the home, have now come into common use not only on privately owned yachts and first class passenger ships but also on ships of all classes.

The ship today, like the home of today, is wired to permit of the use of the many electrical appliances that add to the comfort of the voyage.

Westinghouse Appliance Specialists will be glad to cooperate with shipbuilders and architects.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Principal American Cities
Special Pacific Coast Representatives
Hunt, Mirk & Company, San Francisco

Westinghouse

WAR DEPARTMENT

SEPTEMBER

Sept 8 — TRACTOR BIPLANES — Washington, D. C,, Sealed Bid. For catalog write Chief, M. D. & S. Sect., Air Service, 2624 Munitions Bldg., Wash., D. C.

Sept. 12 — AERONAUTICAL INSTRUMENTS—Washington, D. C., Sealed Bid. For catalog write to address above.

Sept. 12—Q. M. SUPPLIES—Port Newark, N. J., Auction. For catalog write Q. M. S. O., 1st Ave. and 59th St., Brooklyn, N. Y.

Sept. 15—Q. M. SUPPLIES—Camp Meade, Md., Auction. For catalog write Q. M. S. O., 1st Ave. and 59th St., Brooklyn, N. Y.

Sept. 19—ORDNANCE MATERIAL — Frankford, Pa., Auction. For catalog write C. O., Frankford Arsenal, Philadelphia, Pa.

Sept. 20—ORDNANCE MATERIAL, Tullytown, N. J. Auction. For catalog write to address above.

Sept. 21—ORDNANCE MATERIAL — Morgan, N. J., Auction. For catalog write to address above.

Sept. 21—Q. M. SUPPLIES—Omaha, Neb., Auction. For catalog write Q. M. S. O., 1819 W. Pershing Rd., Chicago, Ill.

Sept. 22 — AIR SERVICE EQUIPMENT — Houston, Tex., Auction. For catalog write C. O., Aviation Gen'l. Supply Depot, Houston, Tex.

SEND FOR CATALOG

SELLING PROGRAM

SEPTEMBER

Sept. 25—ORDNANCE MATERIAL — Aberdeen, Md., Auction. For catalog write C. O., Aberdeen Proving Grounds, Aberdeen, Md.

Sept. 26—Q. M. SUPPLIES—New Orleans, La., Auction. For catalog write C. O., Q. M. Surplus Property Depot, Atlanta, Ga.

Sept. 27—ORDNANCE MATERIAL—Watervliet, N. Y., Auction. For catalog write C. O., Watervliet Arsenal, Watervliet, N. Y.

Sept. 28—Q. M. SUPPLIES—Camp Devens, Mass., Auction. For catalog write C. O., Boston Gen'l. Intermed. Depot, Boston, Mass.

Sept. 29—Q. M. SUPPLIES—Norfolk, Va., Auction. For catalog write Q. M. S. O., 1st Ave. and 59th St., Brooklyn, N. Y.

OCTOBER

Oct. 3—Q. M. SUPPLIES—Camp McClellan, Ala., Auction. For catalog write C. O., Q. M. Surplus Property Depot, Atlanta, Ga.

Oct. 4, 5, 6—ORDNANCE MATERIAL — Erie Howitzer Plant, Pa., Auction. For catalog write C. O., Frankford Arsenal, Philadelphia, Pa.

Oct. 5, 6— Q. M. SUPPLIES—Camp Knox, Ky., Auction. For catalog write Q. M. S. O., 1819 W. Pershing Rd., Chicago, Ill.

Oct. 10 — AIR SERVICE EQUIPMENT—Dorr Field, Fla., Auction. For catalog write C. O., Dorr Field, Fla.

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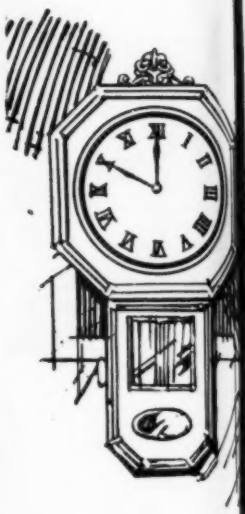


The Government reserves the right to reject any or all bids.

WAR DEP

Advertising Index will be found on page 146

7-G-A

Hundreds of Dollars from Ten Minutes of His Time

—he is one of your clerical force——

YOU know this man.

Eight hours of his time, six days a week, belongs to you. He is in your office to serve your interests to the best of his ability. If he is properly directed, ten minutes of his time, every now and then, will put hundreds of dollars on the right side of your ledger. Here's how—

Have Him Get Catalogs of All War Department Sales

Virtually every day there is a sale of War Department surplus materials. Every time the auctioneer's hammer falls, or an award is made to a bidder, somebody gets a bargain that means quick and certain profits.

Perhaps not all these sales would interest you—the commodities offered might not be in your line, or the sale might not be convenient to your place of business.

But, you never can tell.

The only way to be *certain* no profit opportunities are overlooked is to get the catalogs and check up the offerings in all sales.

This you can do easily and with negligible expense by having a clerk lay aside his pencil for ten minutes and send for our free information.

Every sale is advertised in business papers and the daily press. Each ad tells where you may obtain catalogs. Have all War Department ads routed through your establishment so they reach your "Catalog Clerk" for prompt attention. It will pay.

J. L. FRINK, Chief, Sales Promotion Section,
Office, Director of Sales,
Room 2515 Munitions Building, Washington, D. C.

PARTMENT

Diana, the New Cruiser Champion

(*Continued from page* 28)

the two, could have completed the course much sooner, but due to unfamiliarity with the waters of Northport Bay was practically overtaken about the finish by Harpoon. The elapsed time of both was about ten hours and ten minutes, so that the average speed of these boats was only about 11 knots. As they are capable of speeds in the neighborhood of 22 m.p.h. it is probable that they tarried on the way.

The class for cruisers had six entrants of which only five crossed the starting line. The veteran racing skippers of Diana, Spendthrift and Nandu crossed the line practically at the same time and headed promptly for their turning point at Stratford Shoal. They were followed closely by Momo and Senator Bill, the other contestants in this class. Unfortunately, there was some interference by a non-competing boat which caused one of the competitors to depart sharply from his course in order to avoid a collision. It would seem that motor boatmen who are familiar with racing could allow the contestants in a race all the necessary sea room without crowding them from their chosen course.

The weather on the day of the race was unusually fine, with hardly a breath of air to ripple the surface of Long Island Sound. It was an easy matter to hold a course under these circumstances and no great navigational ability was called for. The course was only fifty nautical miles in length and hardly long enough to cause any serious difficulties with power plants. While the conditions of the Deed of Gift governing the trophy stipulate a minimum distance of fifty miles, a longer race would unquestionably prove more satisfactory.

The absence of competition in the class for express cruisers is regrettable. The fact that only two contenders appeared in this class both coming from the same club made it certain that one or the other would take the trophy back home. Both Comm. Cornell and Captain Brooks deserve great credit in completing this long, tedious sail over event when there was no incentive to competition. The slow time which was made by these boats is no indication of the speed which a challenger will be called upon to show to wrest this trophy away from them next year. Both Comm. Cornell and Captain Brooks stand ready to meet all comers in the express cruiser class in a race for this trophy next year. The way they express it the more there are the better they will be pleased.

The fact that the express cruiser trophy has now been taken to the Middletown Yacht Club and the Cruiser Championship Trophy to the waters of the Delaware will give these localities a splendid opportunity to demonstrate what they are capable of in the way of staging a long distance race of national importance. The Middletown Yacht Club with its cruisers Harpoon and Adriel Too stands ready to defend this trophy in a race next year and if the thoughts of Comm. Cornell on this subject are carried out the race will be a good healthy sea-going one which will try the mettle of any possible contenders. Comm. Cartledge, the winner of the Championship trophy also has some decided ideas on the length of the course necessary to make an interesting race. As the Deed of Gift for the trophy stipulates that at least fifty nautical miles of the course must be laid out in the open sea, sound, or bay and shall be as free as possible from tidal currents of which local knowledge would afford an undue advantage, it follows that the next race will be on waters which have not been previously used for this event. The race should be run between June 15 and September 15 and a challenge must be delivered before May 1 of next year.

As usual, in a race which is run under the conditions requiring the revolutions of the motors to be taken at fixed intervals during the journey, the committee is faced with the problem of computing the ratings according to these revolutions and determining the corrected time of the various contestants after the finish of the last boat. This task is not an agreeable one since it is generally performed under pressure and amid the eager questioning of all the contestants who are naturally anxious to know just what their position is. In order to accomplish this work to the best advantage the committee would prefer to be marooned miles away from the finish. Much more effective work can be done in a half-hour undisturbed than is possible in several hours of time with frequent interruptions.

During the computation of the results a discussion arose on the best way of determining the midship section of the boats under the rules. As provided at this time the area of the midship section is taken as the product of the waterline beam and a depth taken at a point one-fifth of the waterline beam inboard from the hull. The resulting area is naturally an approximation and the discussion resulted in the conclusion that it might be advisable to so revise the rules as to permit the taking of the midship section by using two depths, taken at one-sixth and two-sixths of the waterline beam. This will result in a more closely correct area and lead to a little finer result in the rating. Since the rules have demonstrated their correctness when applied with the strict supervision called for in these contests it is quite probable that a modification of the method of taking the midship section would result in very close finishes in this contest.

For the statistically inclined a complete summary of results follows:

Summary of Results—Cruiser Championship Races—August 5, 1922

Express Cruisers

Boat	*Owner*	*Club*	*Rating*	*Allowance*	*Elapsed Time*	*Corrected Time*
Adriel Too	L. M. Brooks	Middletown Y. C.	73.10	Scratch	9:40:38	9:40:38
Harpoon	M. S. Cornell, Jr.	Middletown Y. C.	68.38	27:19	9:40:44	9:13:25
		Cruiser Class				
Diana	A. B. Cartledge	Philadelphia Corinthian Y. C.	44.91	Scratch	4:25:37	4:25:37
Nandu	Brigham & Hussey	Shelter Island Y. C.	44.94	Scratch	4:28:12	4:28:12
Momo	F. C. Moe	Crescent Athletic Club	36.88	1:00:19	5:35:10	4:34:51
Spendthrift II	Halsey & Van Amringe	Larchmont Y. C.	42.35	0:16:25	4:59:09	4:42:44
Senator Bill	L. A. La Roche	New York A. C.	40.02	0:34:06	5:31:41	4:57:38

Glorious Racing Season Everywhere

(*Continued from page* 45)

The entrance fee is twenty-five dollars, which will be returned to every starter. The right is reserved to cancel entries if three are not received in each class.

Though they will start together, the step boats and displacement boats will not in any sense compete with each other. With the possibilities of the weather and the turns involved, the water conditions give every boat a chance. The fans will have opportunity to compare all kinds of speedsters in action. Speed, seagoing qualities, turning ability and reliability all will count, the latter probably more than any. Of course, seamanship and good judgment will be a factor. It is certain that the 600-inch contest will do much to develop good boats, and buyers of the future will be benefited by these pioneers. Many will await the result with interest.

Hurricane II Winning

AT last, a speedboat that is eligible to represent the Pacific Coast in Eastern Regattas. Not only in name, but in action, because the Hurricane II is considered the champion here.

She is owned by W. W. Paden, prominent business and clubman of Los Angeles, and just recently established a record for the fastest mile ever covered by a speedboat on this coast.

Within the last two months Hurricane II experienced a winning streak and carried off first honors in four events, three of them were held in San Francisco Bay and the other one off Avalon, Santa Catalina Island.

Flying the colors of the California Yacht Club, Hurricane II won the 32-mile free-for-all, the four-mile handicap race and the record for the fastest lap in the speed boat contest held in San Francisco Bay June 15.

Averaging better than 50 miles per hour in the rough water, Hurricane, driven by Billy Cubbons and representing Los Angeles, took the lead from the start and steadily increased the margin in both events between herself and C. E. Miller's Miss California.

The winner's time was recorded at 35 minutes, 52½ seconds, and as a result of these events Paden was awarded three beautiful trophies valued at several hundreds of dollars.

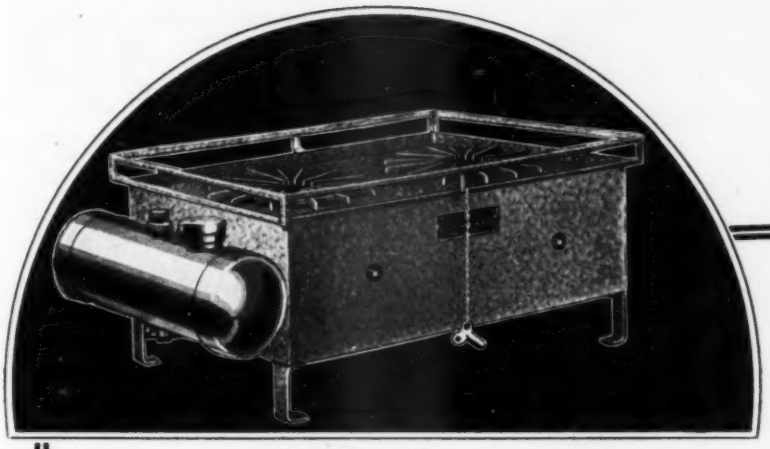
A four-mile course was used and was laid off the old exposition grounds of San Francisco and Miss California represented the northern part of the State.

Fred Vogler, of Portland, and his Vogler Boy III was expected to enter in these races, but did not show up when the starting gun was fired.

Paden's boat is of a one-step Hacker design and is powered with a 12-cylinder Liberty motor.

In the free-for-all event Miss California, equipped with a pair of Fiat engines, gave promise of a fast race at the start, but shipped so much water in making a turn that her engines were swamped and she had to retire.

(*Continued on page* 102)



Specifications:

Size, 20¼" x 10½" x 5½"; legs 2" high; body made of galvanized iron; strongly riveted; all fittings galvanized or of copper or brass; tank made of brass, carefully tested; has rail around top to prevent utensils from sliding off. Burns ordinary motor gasoline—gives a steady hot blue flame that a thirty mile wind can not blow out. Equipped with a full sheet of galvanized iron for covering of table or bench on which stove is mounted. Has slots for legs to fit into. Pump and funnel with each stove.

Price, complete, $20.00

GALLEY Auto KOOK KIT

TRADE MARK

The practical and efficient Galley stove for fresh and salt water craft

ALBERT H. MEADS
ATTORNEY AT LAW
CHAMBER OF COMMERCE BUILDING
CHICAGO

July 8,1922

Prentiss-Wabers Stove Company,
Wisconsin Rapids, Wisc.

Gentlemen:

I have recently installed one of your galley Kook Kit Stoves in my cruiser "Standard" and in justice to you and in the hope that it may induce others to realize the comfort which your device brings to the boat owner, I am sending this letter without solicitation on your part.

I have used the stove in a fresh east wind with quite a heavy sea with two port holes, galley ventilator and companionway all open so as to give the apparatus a real test. The circulation of the air through the galley and all these openings had no effect upon the flames.

I have tried some four or five different devices before using your equipment, and I can say this is the first time that I have obtained complete satisfaction.

I wish to take this opportunity to thank your local representative, Mr. Treat, for the courtesy which you have shown me in the prompt filling of my orders.

Very truly yours,

Here is one of many letters from our files.

They are the best advertisements we can use.

The AUTO GALLEY KOOK KIT is a real practical gasoline stove for marine use. Built especially for galley use—efficient—occupies minimum space—made of the very best materials obtainable—economical to operate—perfectly safe under all conditions.

Send for illustrated folder giving complete descriptions of the complete line

PRENTISS-WABERS STOVE CO.

General Offices and Factory 108 Spring Street, Wisconsin Rapids, Wisconsin

Eastern Distributors:
Mr. Chas. G. Johnston, 98 Park Place, New York, N. Y.
Canadian Boat & Engine Exchange, 43 Yonge St., Toronto, Ont., Canada

For Larger Craft

If desired, Auto Galley Kook Kit can be furnished with the tank separate from the stove, and equipped with 15 feet of copper tubing so the tank can be mounted on deck. Price, complete with 3 gal. tank, 10" pump. **$22.50**

Price, complete with 1 gal. tank, small pump. **$27.50**

Put a MOTOR MASTER ON EVERY SPARK PLUG

MOTOR BOATING
119 WEST 40TH STREET
NEW YORK

July 31, 1922.

Mr. H. S. Dunbar,
Motor Master Company,
646 No. Michigan Ave.,
Chicago, Ill.

Dear Sir:

I want to tell you about the performances of your Motor Masters with which several motors have been equipped which have been under my personal observation this summer:

On one of the high speed, high compression, 450 h. p. motors in Gar Wood's express cruiser, Gar Jr II, we placed your Motor Masters on June 26th and they have been in there ever since and have given absolute freedom from plug fouling, in fact, no plug has been changed although the cruiser has been run about 1,000 miles since June 26th to date.

In my own boat in which is installed a 20-35 h.p. Sterling motor, I have given your Motor Masters a trial and upon examining the plugs yesterday, I found them in as clean a condition as on the day when they were installed. The motor seems to operate more economically when equipped with Motor Masters and I have particularly noticed that the spark controls can be advanced considerably further now without the motor knocking, than was possible before my engine was equipped with Motor Masters.

It seems to me that the marine field is an ideal one for the Motor Masters, in as much as marine engines run with throttle full open all the time which might be compared to an automobile going up a steep hill 100% of the time it is on the road. It is quite obvious that such a condition would be a most severe one for an automobile, but this is exactly the condition that a marine motor is working under constantly. In other words, one of the biggest problems of the marine engineer is to take the knock out of the motor with full advance of the spark. The Motor Master seems to do just this.

Very truly yours,

C. F. Chapman

Editor

WHEN experts like Gar Wood endorse Motor Masters, isn't it time for you to give them a trial?

Gar Wood's unparalleled success with racing boats is the result of his expert knowledge of boats and motors, his constant efforts to improve their design and operation, his readiness to adopt every advance in construction or equipment that proves its value on actual trial. Consider his facilities for testing and comparing results under the most exacting conditions.

Motor Masters have been tested and approved by thousands of motor users, racing drivers, engineers and experts. Their value is a demonstrated fact. They save gas, save trouble and save your motor from rapid wear.

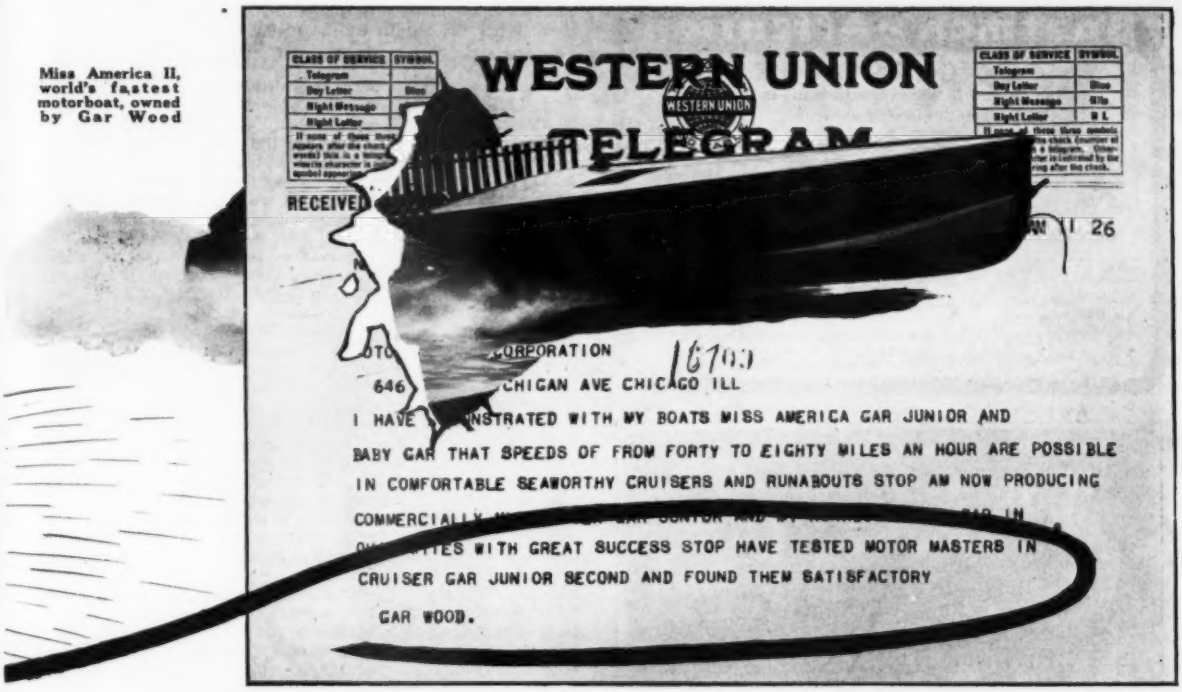
Can you afford to overlook Motor Masters? Order a set for your motors to-day.

Gar Jr. II

Gar Wood's famous Express Cruiser. Holder of more world's records for speed and long distance cruising than any other boat ever built.

Advertising Index will be found on page 146

Miss America II, world's fastest motorboat, owned by Gar Wood


WESTERN UNION
TELEGRAM
RECEIVED
CORPORATION
646 CHIGAN AVE CHICAGO ILL
I HAVE NSTRATED WITH MY BOATS MISS AMERICA GAR JUNIOR AND
BABY GAR THAT SPEEDS OF FROM FORTY TO EIGHTY MILES AN HOUR ARE POSSIBLE
IN COMFORTABLE SEAWORTHY CRUISERS AND RUNABOUTS STOP AM NOW PRODUCING
COMMERCIALLY
TES WITH GREAT SUCCESS STOP HAVE TESTED MOTOR MASTERS IN
CRUISER GAR JUNIOR SECOND AND FOUND THEM SATISFACTORY
GAR WOOD.

No matter how smoothly your engine runs, you'll find it runs better and smoother and gives more power on less fuel after you install a set of Motor Masters. The improvement is startling—a trial will astound you. And we guarantee results, with an absolute money-back guarantee.

What is the Motor Master?

Motor Master is a scientifically designed auxiliary firing chamber into which the spark plug is screwed. It is machined out of solid brass,—rustproof and indestructible. No moving parts so it can't wear out or give trouble. It will outlast your motor.

What does Motor Master do?

First of all, the shield on the lower end of Motor Master protects the sparking points from oil. The plugs cannot be fouled or short circuited by oil or carbon.

Present-day gasoline won't gasify at ordinary temperatures. It enters the cylinders a wet, sluggish mixture of air and gasoline drops. Ordinarily you burn only a part of this mixture—the outside of each drop—the rest goes out through the exhaust or leaks down past the pistons to dilute the crankcase oil.

Motor Master acts as a fuel vaporizer inside the cylinder. The shield heats up with the first explosion and this hot-spot turns the fuel into a highly explosive dry gas.

As a result the gas surrounding the sparking points in the Motor Master chamber ignites instantly. It shoots a flame of fire out into the cylinder and burns the gas and oil to the last drop. There's nothing left to form carbon.

Motor Masters solve the biggest problems confronting automotive engineers and operators today. They overcome fouled spark plugs, carbon troubles, oil pumping, dilution of lubricating oil, fuel waste and incomplete vaporization of gas.

Be sure to cut down your mixture—less fuel is required. Motor Masters must be installed in all cylinders. The right mixture for a cylinder with Motor Master is too lean for cylinders without it.

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We guarantee to refund purchase price and return transportation charges on any set of Motor Masters purchased through any authorized dealer, if returned within 30 days of date of purchase.

Sold by the Best Dealers Everywhere

Prices $5.00 for a 4 cylinder set, up to $15 for 12 cylinders. Get a set on trial to-day from your dealer. Dealers can be supplied by any good jobber or by the

Motor Master Corporation

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Room 324, 646 North Michigan Avenue
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Boatmen -- Attention!

Actual Photograph

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Warm, Comfortable, and Cold Proof

All-wool, closely woven. One piece, including hood. Two pockets. Gray-drab. Hood equipped with draw-string, making it snug-fitting around face and neck. Slips on like sweater; no buttons. Thoroughly tested by U. S. Govt. in North Seas.

Wonderful Weather Protection without bundling. Allows freedom of action. Heavily made for hard wear. Attractive. Order immediately. Supply limited. Give chest measurement. **Actual value $12.** Sent postpaid anywhere U. S. receipt of check, currency, or money order for..... **$5.90**

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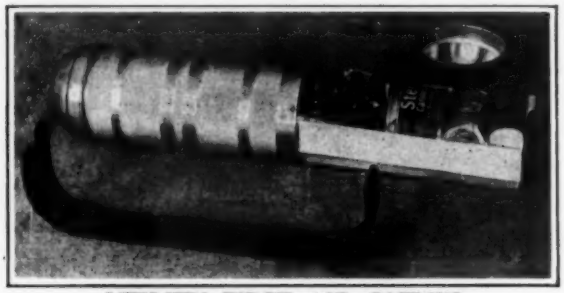

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is a necessity, but you must see this to appreciate its completeness. It is compact, sanitary and attractive. The contents are standard first aid requisites. Price $5.00.

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Electrically Propelled Non-Sinkable Cruiser

"LIGHTNIN"

READY NOW FOR IMMEDIATE DELIVERY

Write for Information
WILLIAM T. DONNELLY
Room 1023 17 Battery Place, N. Y.

Fleetfoot, a Fast Runabout

(*Continued from page* 31)

This should be followed with a coat of lead paint up to the water line and if the remainder of the hull is to be painted it can be carried clear up to the deck. The entire inside of the hull is to have a coat of hot oil and when dry a heavy coat of lead paint should be applied on the bottom and sides up to the deck. A finishing coat of any desired color where exposed should then be applied. The outside of the hull can then be finished with three coats of the desired color and the bottom given three coats of valspar bronze. The decking and all interior work to be thoroughly dressed and cleaned up, properly filled with the best filler followed by a priming coat of Valspar. Seams are to be filled with white seam composition and are then to have two coats of Valspar throughout. All work is to be well sanded and prepared with No. 00 sand paper between successive coats. The flooring will be either finished natural or in two coats of a desired color. Seat tops are to receive three coats of varnish.

Fastenings: All fastenings where exposed are to be of bronze or copper. If galvanized, they are to be red leaded and wood plugged. Brass screws should be used below the water line and galvanized ones above. All screws are to be at least three times the length of the material being fastened.

HARDWARE AND FITTINGS

Steerer: To be of the scored drum type with a 16-inch wheel. It is to be mounted on either side 11 inches from the coaming to the center. A ¼-inch bronze cable leading through 3-inch sheaves and fairleads will turn the rudder.

Rudder: Will be of manganese bronze to suit the design. It will extend through the keel and a special stuffing box supported with a special hanger bracket. It will be arranged with a special sliding type tiller and sheaves which are to be aligned to meet the center of the yoke on the tiller to insure equal wear.

Strutt: Will be of manganese bronze of special pattern to suit the design. It will be aligned to suit the shaft and securely bolted with six ⅜-inch bronze bolts. It is to be babbitted with the best babbitt metal for a suitable bearing.

Shaft Log: This will be self aligning type of the Mechanical Devices Company or Hacker type. It will be securely screw and bolt fastened to the keel laid on canvas and marine glue. It should be suitable for a 1⅛-inch shaft.

Gas Tank: This should be of the seamless steel type cylindrical in shape and about 14 by 30 inches in size. It should be well chocked into place and clamped with 3/32 by 1¼-inch galvanized iron strap with bolt on the top to secure it. It should be installed thwart ships and fitted with a 1½-inch I. P. size filler and pipe to a regulation filler fitting on the deck.

Cutwater: This should be of a special brass built up type or maybe ½-inch half round brass. It is to be securely screw fastened to the stem every three inches and to extend under the keel to station No. 2.

Deck Fittings: Supply one special bow chock, one 2½-inch bitt (electric combination post light may be substituted), one large size special clam shell ventilator, two 5-inch cleats on each side as shown, one 7-inch cleat on after deck, one after flag socket, regulator electric type, one bow flag socket, one cabin type ventilator if water tight bulkhead is used. Hatches are to be mounted with 1¼-inch piano hinges arranged to swing from the center. They are to be fitted with a 1¼-inch eighteen gauge brass binder. These should be screw fastened with oval headed brass screws using ⅞-inch No. 7 into the hinges and ⅝-inch No. 7 into the binder. They are to be fitted with suitable lifting handles and quadrants. There will be two 5-inch chocks on the after deck. The stern is to be bound with 1/16-inch brass to be about 1½-inches in width and securely screw fastened.

Fender: A small fender may be fastened immediately above the water line aft beginning at a point where the top fender intersects the side. This should continue to the stern and be half round slightly tapered towards the stem or of the V-type and bound with ½-inch half oval brass.

Motor installation: The motor is to be a 20 h.p. four-cylinder Kermath. It should be properly aligned, fitted to a 1⅛-inch shaft, then bolted or lagged to the foundation. The exhaust is to be of copper or steel tubing with a 45 degree elbow on the exhaust manifold, followed by a nipple and a union with the tubing. This is to be bent to extend under the flooring to the stern with a reverse bend to allow tubing to go through the stern and about 6 inches above the water. A 5/16-inch copper tube from the manifold should connect into the exhaust line for cooling with water from the water discharge. All water connections are to be properly made. The outboard intake to have a regulation fitting with a scoop and a globe valve on the inside. A standpipe should extend to the motor with an elbow connected to the motor pump with a hose. The overflow is to be made up with pipe or tubing to underneath the floor board and then with a hose to a special overflow fitting. All gasoline piping is to be made with copper tubing. There will be a 5/16-inch line from the tank to a vacuum tank from the motor compartment. A suction pipe to the manifold of 5/16-inch tubing connected to the vacuum tank and a 5/16-inch tube leading to the carbureter with a valve of the No-Leak type on the vacuum tank. Standard S. A. E. compression fittings are to be used throughout. All wiring is to be made up properly and in accordance with the instructions furnished by the motor manufacturer. Motor controls are to be carried to the steering wheel and the starter switch mounted on the foot board so that the cables connecting it and the battery will have the shortest possible length. The motor installation is to be made complete in every respect in readiness for operation. A three blade 16-inches diameter and 18-inch pitch propeller is recommended and a speed of from 17 to 18 m.p.h. may be expected.

General: All necessary equipment such as running lights, anchor, lines, fog horn, extinguisher, cushions, floor covering, etc. are not included in the specifications. If the boat is built by a professional builder these items may be included or furnished by the owner as desired. The equipment should include all of the following: electric or oil running lights, electric horn installed under ventilator, fog horn, fire extinguisher, four cork filled fenders, one 15 pound stockless anchor, one boat hook, one paddle, one bilge pump, two 30-foot lines, cushions to suit (mule skin material, kapoc filled is recommended).

Advertising Index will be found on page 146

What Does It Weigh?

Every Johnson outboard motor is guaranteed to operate satisfactorily as claimed and to be free from defects in material and workmanship.

THE fish? We don't know. The Motor? 35 pounds. It's a Johnson Twin, the lightest outboard motor in the world—the only one you can carry so easily—and the easiest to run. You can slow it down so it will barely twirl a spoon. And yet when you want speed and action just open up the throttle and see her lift the boat's nose out of the water. It works easily—smoothly—almost noiselessly. No shaking vibration to annoy you—no loud noise to drown out voices.

Carry a 35 Pound Johnson With You

on your next vacation trip and on all your trips for years to come. We believe it is the most durable motor built. We know it is the handiest. Takes apart in a minute—fits into our steel carrying case with tackle compartment. The whole outfit is surprisingly light and easy to carry. Think of it! Only 35 pounds. It has—

All the Power, all the Speed all the Durability

Yet Weighs Many Pounds Less

Almost as easy to carry as one pair of oars—does the work of many. Gives you a chance to enjoy both scenery and sports to the utmost. Has a Real Quick Action Magneto. No batteries to renew or to carry. Nothing extra to buy. Has real Carburetor instead of troublesome mixing valve. Spark and throttle control like auto gives wide speed range. Automatic self tilting and self righting feature allows motor to pass over logs, sand bars or to drive boat far up on shore. Instant reverse stops boat in own length even at top speed. Motor beautifully finished in polished nickel and aluminum.

Our new Free Illustrated Catalog Folder tells all about this marvelous Lightweight Motor. Write for it today.

The Johnson Agency is a Real Proposition for Live Dealers

JOHNSON MOTOR CO. 860 Sample St., So. Bend, Ind.

New York Office: Suite 3611 Equitable Bldg., 120 Broadway, New York, N. Y.

Attached to Canoe Gives Power Boat Speed

The lightweight Twin Cylinder 2 H. P. Johnson is the most practical motor for use with canoes. It drives through the water smoothly and quietly at thrilling speed. Its complete absence of vibration prevents shaking canoes and opening seams. Its extremely light weight prevents top heaviness and dipping. In addition to the Lightweight Johnson for rowboats we make—

Inboard and Outboard Installations for Canoes

The same power unit is interchangeable for all installations; can be changed from one to the other in a few minutes.

If you enjoy the pleasures of water sports, if you like the thrill of racing speed—you will find both with small expense in a canoe fitted with one of these Johnson outfits. Write for Free Folders describing the Johnson—

"The Lightest Outboard Motor in the World"

"Built on the Banks of the St. Joe."

Johnson

DETACHABLE MOTOR

for Boats and Canoes

MoToR BoatinG's Ideal Series

Books of Plans of Cruisers, Runabouts, Auxiliaries, and Dinghies

THE BEST HOW TO BUILD SERIES EVER PUBLISHED

Volume I

Designs of Ideal Motor Boats and How to Design a Motor Boat

This volume describes in detail how to design a motor boat. It also contains complete plans of 30 Cruisers, Runabouts and Auxiliaries. The plans include lines, table of offsets, interior plans, profiles, construction details, etc. There is no book published at the present time which describes in everyday language the details of designing a boat according to your own tastes. The plans of Ideal Cruisers, Runabouts and Auxiliaries are complete in every particular. They include the best of the plans published in MoToR BoatinG during the past several years. The plans include boats of from 20 feet in length up to 40 feet. The drawings are all to scale and large size.

Foreign Postage, 50 cents extra. **$2.00**

Volume II

How to Build Sixteen Ideal Motor Boats

This book gives complete information for building the following boats:
10-foot mark boat, 12-foot outboard motor boat, 12-foot speed boat, 12-foot bangabout, 13-foot sea skiff, 16-foot sharpie, 18-foot runabout, 20-foot monoplane, 20-foot hydro-runabout, 20-foot knockabout, 20-foot tunnel stern, 22-foot V-bottom runabout, 25-foot V-bottom cruiser, 25-foot round-bottom cruiser, 28-foot cruiser (Consort II).

Every article is fully illustrated with working drawings and no information or instructions are missing which would be of assistance to the novice to build his own boat.

All of the Ideal Books are printed in large type on extra fine paper. They have been edited by Charles F. Chapman, Editor of MoToR BoatinG.

Foreign Postage, 50 cents extra. **$2.00**

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Twelve Complete V-Bottom Designs

By William H. Hand, Jr.

Plans Prepared Expressly for MoToR BoatinG

This new book is the most valuable ever published for the amateur builder or anyone desiring to have a V-bottom boat built by his own builder.

The plans contain outboard profile, lines, inboard, construction and interior arrangement plans, sectional views and complete table of offsets. Accompanying each design is a description of the boat and a full set of specifications taking up step by step each feature of the boat's construction, how it should be built and the proper material to use.

Plans and specifications of the following boats are included: **Edith, a 15-foot runabout; Jane, an 18-foot runabout; Katherine, 30-foot cruiser; Dorothy, a 25-foot runabout; Zenith, a 25-foot cruiser; Cyclone, a 36-foot auxiliary; Eclipse, a 40-foot express cruiser; Magnet, a 28-foot cruiser; Tornado, a 45-foot auxiliary schooner; Broncho, a 29-foot cruising runabout; Shark, a 21-foot utility runabout; Claire, a 36-foot express cruiser.**

Price of Twelve Complete V-Bottom Designs **$2.00**

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Volume IV Ideal Series

Twenty Easy-to-Build Motor Boats

By William J. Deed and others

A New Book of Small-Boat Plans and How to Build Them

These plans have been prepared especially for MoToR BoatinG and are complete in every particular. They are in detail enough to permit building from direct, either by the amateur or professional builder. No part of the boat's design or construction has been omitted or slighted.

Read the contents: Chum, a 16-foot Motor and Sail Craft; a 9-foot Easy-to-Build Dinghy; Nomad, a 34-foot Cruiser; a 9-foot Sharpie; Porpoise, a 20-foot Auxiliary Cat Boat; Kingfisher, a 14-foot Fishing Skiff; Shrimp, a 25-foot Hampton Boat; Flattie, a 16-foot Utility Boat; Dolphin, a 34-foot Tunnel Stern Cruiser; a 9-foot Dory; an 8-foot V-Bottom Tender; Penguin, a 25-foot Auxiliary Sloop; Sea Gull, a 41-foot Auxiliary Schooner; Whale, a 20-foot Cruiser that's a Real Cruiser; Tarpon, a 29-foot Raised Deck Cruiser; Alligator, a 28-foot Tunnel Stern Cruiser, a boat that will run in water little deeper than a heavy dew; and Mud Turtle, a 36-foot Stern Wheel Motor Boat. Rookie, a 20-foot Auxiliary Sloop; Nautilus, a 40-foot Tunnel Stern House Boat; Victory II, the Cruising Champion; Complete Bills of Material for Building.

Book is printed in large type, on fine paper, and handsomely bound in cloth.

Price of Twenty Easy-to-Build Motor Boats **$2.00**

Foreign Postage, 50 cents extra.

Price of all four books of Ideal Series (Vols. 1-4) if ordered together **$6.00**

Foreign Postage $1.00 extra.

Volume V Ideal Series

Piloting, Seamanship and Small Boat Handling

By Charles F. Chapman

This book has been published in response to repeated requests for us to bring out in complete book form the wonderful illustrated course in Piloting, Seamanship, and Small Boat Handling which has been appearing regularly in the issues of MoToR BoatinG since February, 1921.

Profusely illustrated with nearly 300 Cuts and Diagrams.

MoToR BoatinG's Correspondence Course proved to be the most successful and most popular feature ever undertaken by a boating magazine. Thousands of readers became better boatmen by studying this course. Now you will want it in permanent book form to keep aboard your boat for reference and guidance.

This course was prepared with an entirely new idea in text book or correspondence instruction. Instead of page after page of dry text matter with only occasional illustrations, it is composed mainly of pictures, drawings, photographs, charts and diagrams covering every situation and every point, with the purpose of each picture clearly explained by a concise and simple title.

You will find this book more enjoyable and easier to understand than any text book you ever read. You will find it correct and authoritative because it has been prepared by experts with years of boating experience and every necessary reference at hand.

You will find it easy to read and easy to remember because each chapter is reviewed by pertinent questions which reveal your understanding of the lessons.

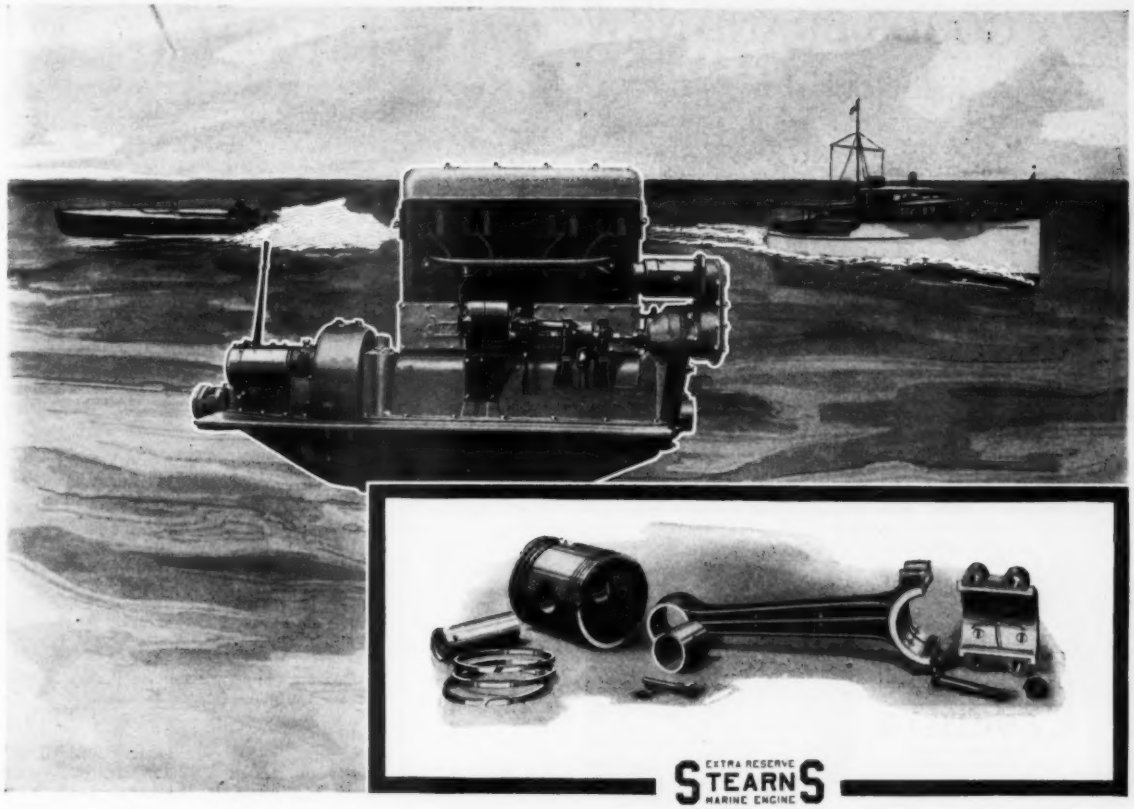
Price of Piloting, Seamanship and Small Boat Handling **$2.00**

Foreign Postage $1.00 extra.

Note:—Volume V is not sold in combinations with the other books of Ideal Series.

MoToR BoatinG, 119 W. 40th St., New York, N. Y.

Advertising Index will be found on page 146



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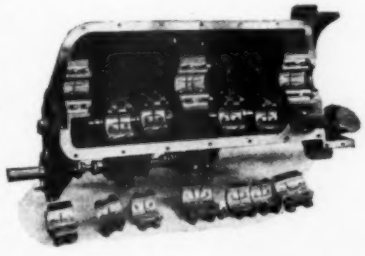
A STRUCTURE of any kind must have a solid and firm foundation—the same is true with a marine engine. The Stearns Extra Reserve Marine Engine has almost 50% more bearing surface than any other marine engine of similar horsepower rating.



The center and rear main bearings of the large series of engines are 2⅞" x 4½" and the front bearing is 2⅞" x 4". The small series has proportionately as much bearing surface, the center and rear are 2½" x 4" and the front 2½" x 3½". A thin film of oil under pressure carries the entire load.

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Its quality of construction—its admirable service qualities—its low cost, first cost, low fuel and maintenance cost will please you.

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Model MAU 4¾ x 6½"
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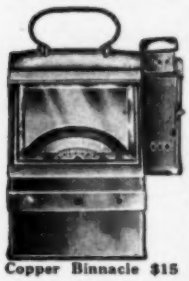

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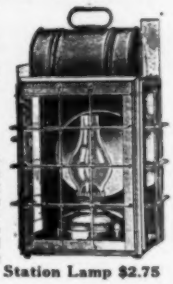

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⅜" Manila Rope 5c ft.

COMET TACHOMETER

Price $27.00

Specialists in electrical equipment for motor boats and yachts. Comet Boat Lighting Plants, Generators 6-8 volt to 110 volt, Switchboards, D. C. Magnetos for make and break or jump spark. Tachometers, etc.

Write today for Bulletins and prices.

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Successful Students in Correspondence Courses

The questions on Lesson No. 6 of MoToR BoatinG's Dead Reckoning Course are printed below and all answers to these should be sent in to the Editor of MoToR BoatinG, 119 West 40th Street, New York, N. Y. promptly. The subject of Middle Latitude Sailing to which these questions refer was fully covered in the August issue of this magazine. All examples given should be completely worked out and in the answers which are sent in all work should be shown. The subject of Mercator sailing has been covered in this issue and questions on this chapter will be published in the next number.

Answers are still coming in to the lessons in the previous Correspondence Course in Small Boat Handling, Seamanship and Piloting subsequent to lesson No. 8. The answers to all previous lessons have already been published and this issue discloses the answers to Lessons Nos. 6 and 7. Naturally it is no longer possible to receive answers from students pertaining to any of the lessons to which the answers have been published. Additional pilot certificates are being sent out to those fortunate enough to successfully pass all thirteen lessons. The names of all who have submitted papers during the month of July and were successful in passing them are printed below.

Entitled to Pilot's Certificates:
F. Rudolph, F. W. Salmon, N. F. Woodhull.

The following have passed lessons in Correspondence Course:
Lesson No. 4: J. H. Belt, A. F. Keck.
Lesson: No. 5: F. W. Mosteller, Mrs. John J. Slater, F. W. Salmon, Roy E. Williams.
Lessons Nos. 6 and 7: B. P. Boell, K. DeHart, Elsie L. Fenton, A. F. Keck, F. W. Salmon, N. F. Woodhull.
Lesson No. 8: K. DeHart, Andrew Dunlop, Elsie L. Fenton, Lewis Frederic, W. A. Royce, F. W. Salmon.
Lesson No. 9: K. DeHart, Andrew Dunlop, F. W. Salmon.
Lesson No. 10: F. W. Salmon.
Lesson No. 11: F. Rudolph, F. W. Salmon, H. Lloyd Williams, N. F. Woodhull.
Lesson No. 12: Forrest D. Greene, Don. C. McClean, F. Rudolph, F. W. Salmon, H. Lloyd Williams, N. F. Woodhull.
Lesson No. 13: Walter Monroe, F. Rudolph, F. W. Salmon, N. F. Woodhull.

The following have successfully passed lessons in Dead Reckoning Course:
Lesson No. 1: Milton Bailey, W. E. Roberts, F. C. Rudolph.
Lesson No. 2: E. F. Matthews, William O. Yates, E. T. Youngfelt, C. S. Young, F. C. Rudolph, W. E. Roberts.
Lesson No. 3: L. E. Wilson, L. H. Chapman, F. C. Rudolph.
Lesson No. 4: R Andren, F C Rudolph, Percy S Benedict, Dr. A. B. Bennett, L. G. Barton, John C. Brodhead, V. C. Baird, Vincent Francis, L. P. O'Keefe, William H. Palmer, F. B. Smith, Fred'k. W. Salmon, Fred'k. E. Smith, David Snitzer, William O. Yates, C. S. Young, H. T. Zachgo, Frank Zueger, Ralph Christie, J. V. Lawrence.

Questions on Lesson No. 6. Middle Latitude Sailing

1. What is Middle Latitude Sailing, and for what purpose is it employed?
2. On what assumption is it based? Is the assumption accurate, and, if not, is the error material? If material, in what cases?
3. If the ship's track crosses the equator, may it be assumed that the middle latitude is one-half the sum of the latitude left and the latitude in?
4. In what cases is it preferable not to employ the Middle Latitude Sailing method? What other methods may then be used?
5. How would you find the difference of longitude between two places of different latitudes, both places being within 5° from the equator?
6. Give the Middle Latitude formula for finding D Lo and Dep?
7. How do you use the Traverse Table to solve a Middle Latitude problem?
   Submit complete solutions of the following, and not merely the answers.
8. (Compute) From Galera Point, Trinidad Island, take Course N 63° E, Dist 521.7 miles, and find Lat and Long in, by Middle Latitude Sailing.
9. (Compute) From Mauritius, Flat Island Lighthouse, to Diego Garcia. Find Course and Dist by Middle Latitude Sailing.
10. (Solve by Traverse Table throughout.) Took departure from Cape San Juan Lighthouse, Porto Rico, bearing SW 5.3 miles. Thence sailed N 15° W, 93 miles; N 47° W, 54 miles; N 29° E, 15 miles. SE x E ½ E, 18 miles. Find Lat and Long in, by Middle Latitude Sailing.

Advertising Index will be found on page 146

A SUPERIOR OUTBOARD MOTOR At A Lower Price

Only **$70** For Battery Ignition Type **$80** For Magneto Type

Easy Portability, Bulldog Power, Reliability, Easy Starting Safety, Are Features That Attract Real Sportsmen to the

Spinaway Detachable Rowboat Motor

Workmanship and material of the highest order are responsible for the lightness and reliability of this smooth-running, powerful, sturdy rowboat motor. You will be delighted with its ease of starting and the way it makes the boat glide off like a powerful automobile.

The Spinaway always gives the maximum power of the motor because the adjustable propeller shaft puts the propeller at just the right point in the water regardless of the height of the stern of the boat. Brackets are adjustable to fit practically any boat. Has protected spark plug and disappearing crank handle. A child can operate it.

The Spinaway is built by a company that has always prided itself on fine workmanship. Our rigid guarantee is as much to protect our reputation as master builders, as it is to assure satisfaction to the purchaser.

This is the identical motor that has been selling for $90 and $95. Increased production and reduced manufacturing costs now make possible this remarkably new low price of $70 for motor complete for battery ignition and $80 for the magneto type. It will successfully meet any competition in quality, performance and price.

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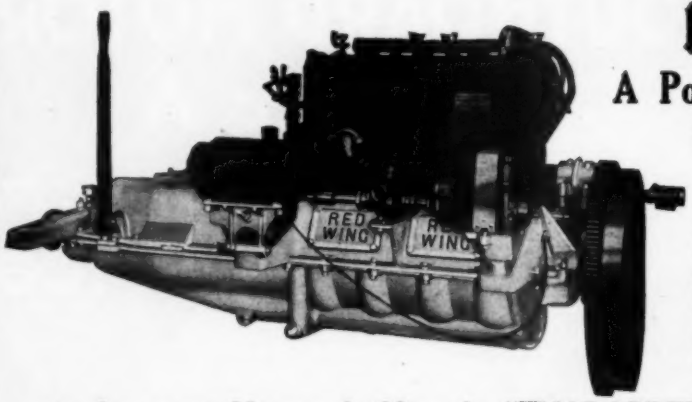
.....

Dealers

We shall be pleased to hear from reliable dealers. We have an interesting, liberal sales plan.



Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE

A Power Plant Is Judged by the Service It Renders

No engine can deliver consistently good service unless it is built properly—and it takes years of experience to know how to build a power plant that will prove reliable and efficient under all conditions and requirements. The Red Wing Motor Company has spent 22 years building the "THOROBRED" motor, and no better recommendation for any product can be found than the realization, in service, of perfection sought for.

The craft owner who depends upon a "THOROBRED" motor for his power, is assured of reliable service at all times. He is not bothered by break-downs, and when repairs are necessary, he knows there is an organization, behind the product, equipped to take care of just such an emergency—promptly and thoroughly.

Five sizes, from 10 to 40 H. P.

RED WING MOTOR COMPANY

DEPARTMENT B **RED WING, MINN., U. S. A.**

Eastern Distributors: Verrier, Eddy Co., 222 E. 42nd St., New York, N. Y.; W. H. Moréton Corp., 780 Commonwealth Ave., Boston, Mass.; W. E. Gochenaur Mfg. Co., 631 Arch St., Philadelphia, Pa.; Hutchinson Bros., Alexandria Bay, N. Y.

Glorious Racing Season Everywhere

(*Continued from page* 48)

Paden shipped his boat to San Francisco aboard the S. S. Yale and upon returning her to Los Angeles she was entered in a 24-mile race which was held off Avalon, Santa Catlina Island, July 4.

Hurricane also won this event, covering the distance of 24 miles in 44 minutes and 45 seconds and had a lead of 200 yards at the finish line.

Entries in this six lap race for the William Wrigley, Jr., trophy included Joe Fellows' Fellows IV, A. L. Fleming's Lincoln and Dustin Farnum's Miss Los Angeles II.

Ol' Joe Fellows finished second, Farnum hit a piece of pilling and dropped out, Fleming's Lincoln developed engine trouble and stopped, leaving our friend Paden to carry off all the glory.

Alvin Frank's Lucky Strike won the 610 cubic inch displacement race after a hotly contested battle with Leon Berner's Skoot and Ralph Hamlin's Joker.

Lucky Strike's time for the 15-mile race was clocked at 28 minutes and 30 seconds, winning the sterling trophy offered by the business men of Avalon.

The Fourth of July regatta thrilled several thousand people who witnessed the event from the beach and aboard several hundred yachts, cruisers and motorboats, flying the colors of the Newport Harbor Yacht Club, Los Angeles Yacht Club and the California Yacht Club.

Dede Wins Race to Newburgh

THE long distance cruising race of the New York Motor Boat Club to Newburgh and return attracted thirteen entrants. Of these only eight were able to start on time owing to the celebration at the annual meet of the Waterway League held at the New York Motor Boat Club on the day previous to the race. The race was run under American Power-Boat Association handicaps, all boats having been measured and rated for the purpose. Two of the boats which had entered were found to be in the express cruiser class and a special class was provided for them. A non-stop trip to Newburgh and return was made by all the contestants and the results placed Dede, owned by Commodore H. C. Granneman of the Gravesend Bay Yacht Club, in first place. Her corrected time proved to be 7:43:17 while her elapsed time was 9:06:40. Ruth II, owned by Walter Dodd of the Era Yacht Club, was the second on corrected time with 9:01:50. Stranger, owned by Commodore A. F. Jenkins of the New York Motor Boat Club, was third with a corrected time of 9:08:55. In the express cruiser class Dixie belonging to T. Parkman of the Gravesend Bay Yacht Club finished first in 8:59:40. The other contestants in this class did not finish the race. In the open boat class Ella M, belonging to W. L. Cooley of the Cobweb Yacht Club, was successful in winning the class.

A series of stunt races had been arranged and was conducted during the day for the amusement of the visitors of the club. These took the form of Bang-And-Go-Back races, a chance race, and other similar events. These were won by various members of the New York Motor Boat Club and trophies were presented to them.

Sport at Put-In-Bay

A regatta at Put-In-Bay on July 21 afforded good entertainment for the assembled fleet. The final heat of the Interstate trophy for motor boats of the 625 cubic inch class was run and was the most exciting event of the regatta. It is doubtful if two boats which are more closely matched in speed ever competed in a regatta anywhere. At the start Bear Cat, owned by Dick Locke of the Detroit Yacht Club, was leading Criscraft of Algonac by less than half the length. Bear Cat due to its pole position had the advantage in going around the turns. Throughout the race the boats were closely together leading one another in turn.

In the final dash around the course Bear Cat held her own and won by four seconds. This was the greatest distance between the boats at any time during the race, and the elapsed time shows them to have been doing their best at all times. Bear Cat covered the 20-mile course in 37:42, an average speed of 31.85 miles. Her fastest lap was covered at the rate of 32.2 miles per hour and there was only a variation of six seconds between the slowest and fastest laps. Her Hall-Scott motor performed most consistently and a single skip or miss would have resulted in the loss of the race.

Advertising Index will be found on page 146

QUALITY SNAP RINGS

"Last to Last"

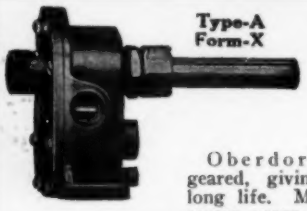
Easy to Install
Quick Seating
Long Lived
Accurate

A PROPERLY designed hull; an efficient propeller and a good engine equipped with QUALITY Piston Rings, means more power and lower operating cost. . . .

More Than a Million a Month

THE Piston RING COMPANY
MUSKEGON, MICH.

Oberdorfer Pumps



Type-A Form-X

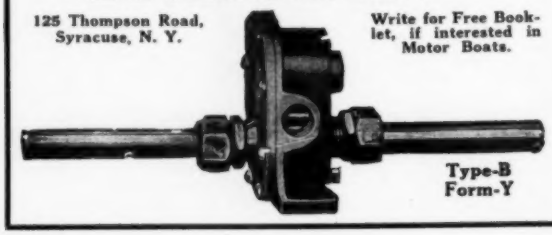
They Last Indefinitely

Oberdorfer Pumps are bronze geared, giving them a remarkably long life. Made to stand the most severe usage. Non-corrosive in salt water. Can be used on any internal combustion engines for the cooling system or for supplying oil or fuel. The speed of the engine governs the discharge. A style for every boat.

M. L. OBERDORFER BRASS CO.

125 Thompson Road, Syracuse, N. Y.

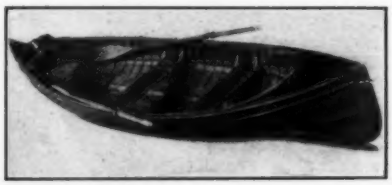
Write for Free Booklet, if interested in Motor Boats.



Type-B Form-Y

SKANEATELES BOAT and CANOE CO.

Established 1893



Boats that will last!

For Rowing, Sailing and Outboard Motor

Write for our catalog

38 Jordan St. Skaneateles, N. Y.

A Superior Valve Metal

PRODUCTION of a poppet-valve metal, or alloy, that would better withstand the destructive forces that are created in the operations of large as well as low-priced internal-combustion motors has been a problem for many years, and the solution to which should be welcomed by every designing engineer and oil-engine builder as well as every motor boat owner and operator.

Because of the severe conditions under which big exhaust-valves of high-powered Diesel-engines—some up to thirty inches in diameter—have to work, it is only natural that metallurgists should have made considerable effort to develop a real valve metal. Such a metal must have the qualities to overcome the need for constant regrinding and replacing of valves. And the means that the metal must stand up under all the destructive elements to which valves are subjected, such as the deteriorating effects of heat, of the products of combustion and of heavy mechanical stresses, together with outside influences such as high sulphur oils, salt water, etc.

While certain progress has been made from time to time with various steels and alloys, the results attained have invariably betrayed weaknesses in one way or another, that little was actually gained over the original and ordinary cast-iron and steel valve which has a tendency to carbonize, warp and deteriorate.

One of the arguments raised against the four-cycle type Diesel-oil engine for marine work by two-cycle engine-builders is that, when using heavy crude and residual oils, such as Mexican fuel—particularly oil with sulphur, varying from one to three per cent, additional work is given to the engine-room crew owing to the exhaust-valves becoming pitted and requiring regrinding every voyage, and sometimes twice per voyage. This, of course, does not occur so often when burning Diesel oils or heavy crudes without sulphur contents such as Taraken oil.

Even this, however, will be dispensed with or greatly reduced, if all the claims and tests of an alloy recently placed on the general market meet with successful confirmation in actual sea-going service in the oil-engines of large and small motorships. Nichrome, a heat-resisting metal developed into valves under patents by the Driver-Harris Company of Harrison, N. J., is now available in large quantities after three years' experimenting and exhaustive test.

So satisfactory and unusual has been the service given by Nichrome valves that they have been adopted as standard equipment by many motorships. A test now under way on a ship which has tried out other valves for which exceptional service has been claimed, shows Nichrome valves still barking strong, without any attention, after 15,000 miles.

In view of the radical benefits that will be derived from the many adaptations of Nichrome, if this new metal proves as satisfactory as tests and present commercial uses indicate, there is but little doubt that it will be widely adopted in his field. Meanwhile, oil-engine builders and operators of boats equipped with such engines, will do well to thoroughly investigate its possibilities and make extended tests for themselves, both in the shops and in ships fitted with their engines in cylinders side by side with cylinders having other valves. The makers will be glad to make a Nichrome valve to the builder's drawing and furnish one for the purpose.

Engineers familiar with the functions of valves in internal-combustion oil-engines will immediately recognize the value of the characteristics outlined in the following, and the great advantages which valves, possessing those characteristics, should add to even the very best designed engines. The points are therefore briefly stated:

Nichrome alloy, for valves, has a tensile strength of 20,000 pounds to the square inch at 900° C.

At temperature approximating 2,000° F., there is no scaling.

Highly resistant to chemical action of combusting fuel.

Will not absorb carbon.

The action of the valves does not injure valve-seats, because they are not extremely hard; but they are hard enough to withstand the shocks from valve rockers.

Are made either in one piece or in two pieces with nickel-steel stem.

Hold compression to an unusual degree, because the heat of exhaust gases does not cause pitting to any appreciable extent.

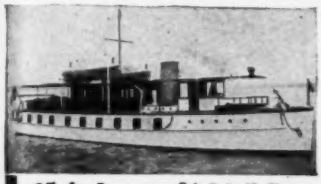
Cannot be hardened or crystallized by heat-treatment; retain their same physical properties as when installed. Therefore, they do not air harden.

The established facts, which are cited above, are based on the performance of a considerable quantity of Nichrome valves made by Driver-Harris for use in Diesel-marine-engines, for marine and automobile engines. So satisfactory have the results been, over a long period of time and even under adverse fuel conditions, that they have felt justified in providing additional manufacturing facilities so as to place Nichrome valves within reach of every designer and builder of internal-combustion engines.

Advertising Index will be found on page 146

MATHIS YACHT BUILDING CO.

Superiority of All Parts, Makes Perfection of the Whole



85 ft. Luneta Col. S. L. H. Slocum Washington, D. C.

80 ft. Nepenthe James Deering Chicago

52 ft. Helen Louise V. B. Hubbel New York

70 ft. Calabash W. J. Matheson New York

77 ft. Dorinda Henry W. Savage New York

106 ft. Leonie Murray Guggenheim New York

Right designing is of little avail, unless that right design is rightly and efficiently executed.

MATHIS-BUILT HOUSEBOATS and YACHTS

are the choice of men who know, the leaders in American industrial and social life, because in the Mathis yards rightly designed boats are efficiently and economically constructed by Master-artisans.

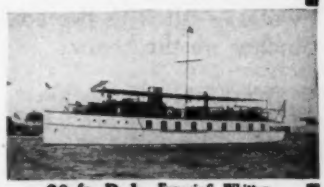
But the Mathis policy goes even further. Only the best of parts and equipment go into Mathis-built boats. Every part of every Mathis-built boat must be the leader in its field in quality and efficiency, rendering the boat owner the utmost in service and dependability.

Inclusion of any part in a Mathis-built yacht or houseboat is therefore high endorsement of its superiority.

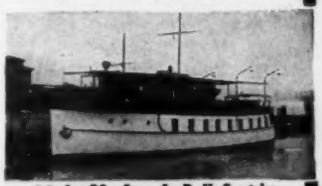
70ft. Lanai Ex. Com. Arthur Curtiss James New York Yacht Club

106 ft. Chieftain L. H. & A. W. Armour Chicago

61 ft. Cyrene R. M. Bond Daytona, Florida

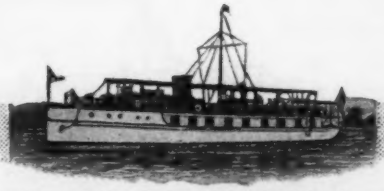


90 ft. Bolo Francis S. Whitten New York



80 ft. Nadesah D. H. Carstairs Philadelphia

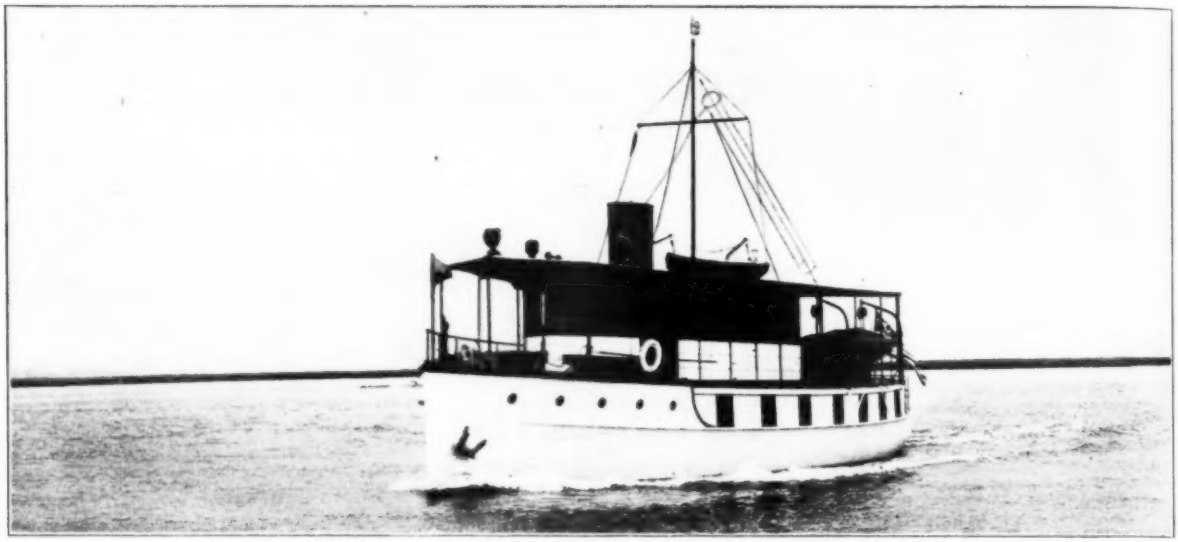
95 ft. Lady Grace F. Fisch New York



HOUSE BOATS AND YACHTS

This insert planned and prepared by Charles Blum Advertising Corporation, Philadelphia

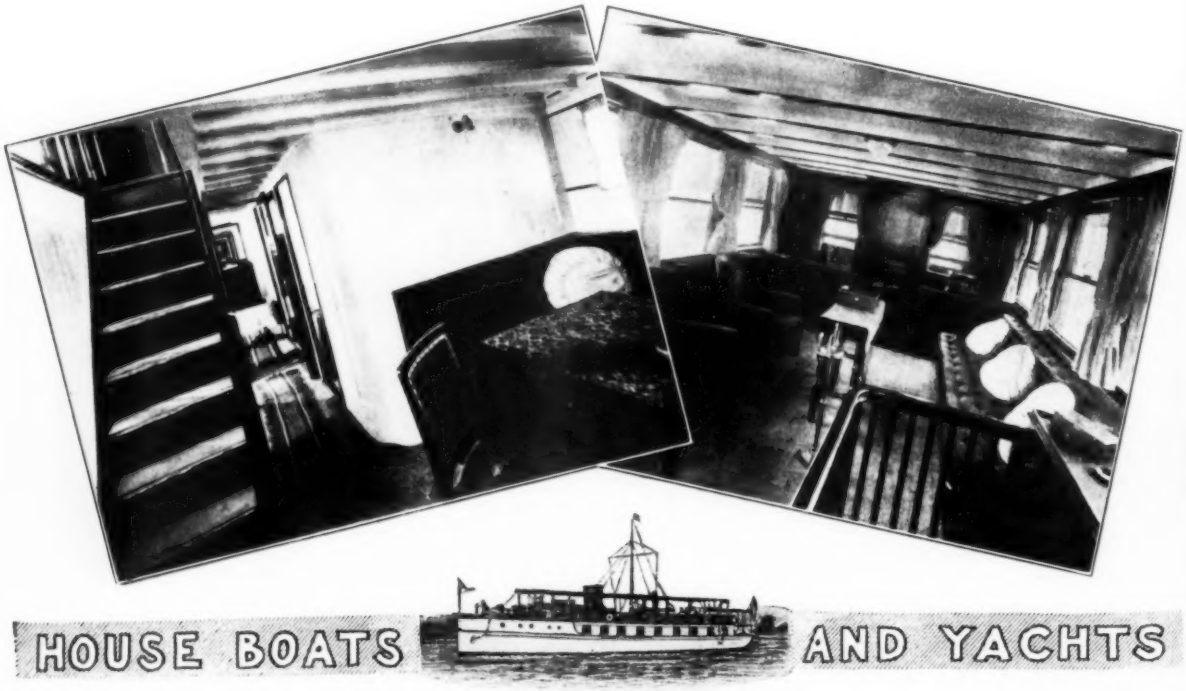
MATHIS YACHT BUILDING CO.



63-ft. Houseboat "Snug," Mathis-Built for Mr. Arthur Block, Philadelphia

DURING the year 1922, the Mathis Yacht Building Company—admittedly leaders in houseboats and cruiser-houseboats since 1910—have set similarly high new standards on distinctively superior express-cruisers such as the "Lazy Lady," and in auxiliaries, such as the auxiliary-sloop "Nedmac."

BUT in houseboats, this season sees new Mathis perfection as in every preceding season. The 63-ft. houseboat "Snug," shown above, creates a distinctive new type, with greatly increased owner's quarters and increased deck-house (as shown below). Lighting and ventilation are perfected on this twin screw houseboat, which is ideal on outside use as well as on shallow inland waters—all with the addition of only 2 ft. on the length of the previous 61-ft. boats and only 6 inches on the beam.



HOUSE BOATS AND YACHTS

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MATHIS YACHT BUILDING CO.

THE 63 FT. HOUSEBOAT SNUG

The twin 32-37 h. p. STANDARD installation in Mr. Bloch's new 63' houseboat "Snug" guarantees to him *the perfect motor boating of a STANDARD owner*:

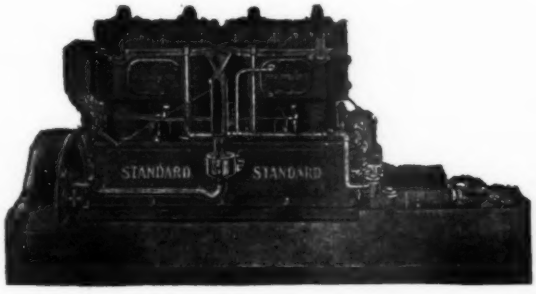
It yields to him the satisfaction of ownership of the best.

It affords him the enjoyment of that developed efficiency, unequalled economy and unapproached *security* of STANDARD operation.

It affords him the satisfaction of sound investment, negotiable at his will.

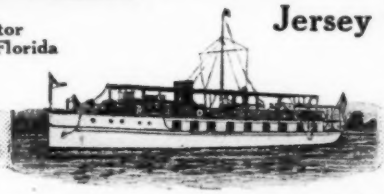
The superiority of STANDARD engined Mathis boats is evidenced by their number and prominence:

Snug ..... Mr. Arthur Bloch	Enchantress III ..... Mr. Louis Burk
Leonie ..... Mr. Murray Guggenheim	Arline ..... Mr. W. G. Selby
Pioneer ..... Mr. E. H. Kluge	Riposo ..... Mr. C. W. Fowler
Nahmeoka ..... Mr. H. N. Baruch	Riposo II ..... Mr. J. Aron
Riposando ..... Mr. H. B. Baruch	Dorothy .....Mr. Hugh L. Willoughby, Jr.
Marylin ..... Maj. Fred'k Pope	Helen Louise ..... Mr. R. H. Peacock
Nadesah ..... Mr. J. H. Carstairs	Riette II ..... Mr. E. G. Shelton
Osana ..... Mr. C. G. Dixon	Equatorial ..... Carib Syndicate
Kingfisher ..... Mr. E. L. King	Azile ..... Mr. B. H. Brown
Cyrene .....Mr. Ogden Minton	Zenith ..... Mr. Eli Ponvert
Miramar ..... Capt. C. N. Swift	Inspector .....N. J. State Board of Health
	Pauline ..... Mr. E. C. Clark
	Alice ..... Mr. E. D. Goelthe
	Miakka ..... Mr. M. Parshall
	Ibis ..... Mr. F. F. Chrystie
	Georgena ..... Dr. G. H. Johnson
	Alela ..... Mr. Henry Gilsey
	Pandora III ..... Mr. Arthur T. Vance
	Alona ..... Mr. C. B. Maloney
	Vigilant ..... Mr. F. C. Bell
	Ordway ..... Mr. G. D. Rosengarten



The 32-37 h. p. Standard Motor
—on finest boats from Maine to Florida

Standard Motor Construction Co.
Jersey City 178 Whiton St. **New Jersey**

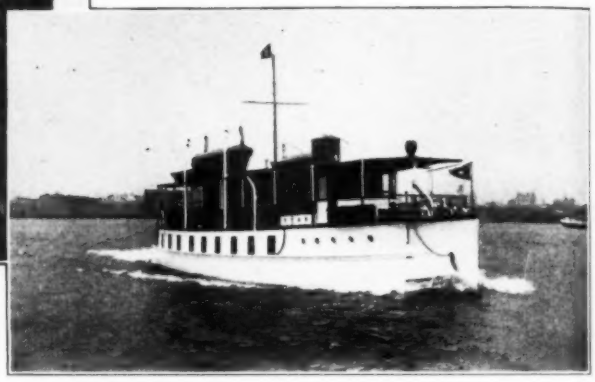
HOUSE BOATS  AND YACHTS

MATHIS YACHT BUILDING CO.

87 ft. Houseboat "Pilgrim"

Mathis-built for Mr. William M. Elkins, Phila.

THE utmost in home comfort, in a palatial boat of exceptionally yachty lines. Owner's quarters, aft, have three double staterooms, one single stateroom, two complete bathrooms with showers (see illustration in Mott advertisement), and one separate day toilet. Large pantry, galley full width of boat and crew's quarters for six men, provide in all ways for long cruises.



THE DECKHOUSE 28-ft. long which serves as a combination dining and living salon and the stairway leading to same from the lobby of the owner's quarters.

Two notable recently built Mathis Houseboats

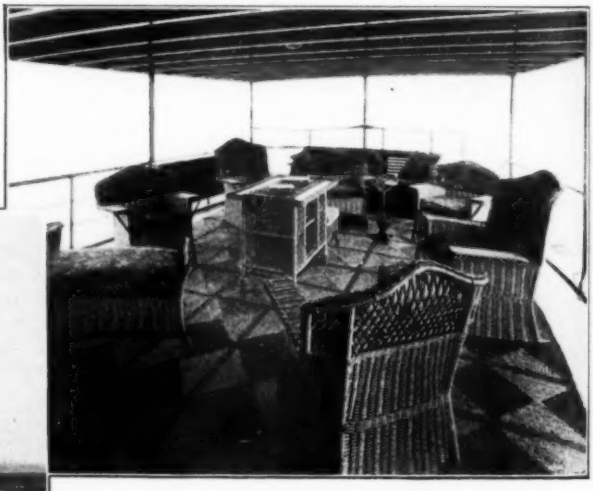
—both under 90 ft. long, yet combining many advantages seldom found in houseboats or cruisers less than 120 ft. long.

Shallow draft on both—only 3 ft. 3 in.—yet seaworthy in rough waters outside.

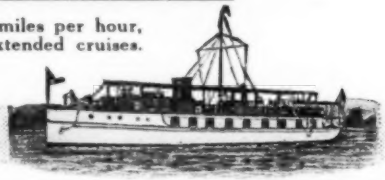
75 ft. Houseboat "Amitie"

Mathis-built for Mr. Charles Prettyman, Phila.

BELOW decks, dining salon, a double stateroom, two single staterooms, two bathrooms. In deckhouse above, living room and owner's stateroom. Like the "Pilgrim," the "Amitie" has a cruising speed of 12 miles per hour, and complete provision for comfort on extended cruises.



THE LARGE AFTER DECK with solid deck above (on which boats are carried), provides an ideal outside lounge for the owner's party.



HOUSE BOATS AND YACHTS

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MATHIS YACHT BUILDING CO.

Winton

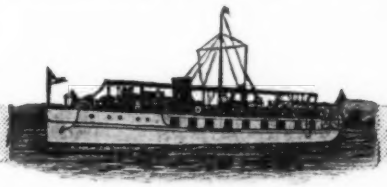
ENGINES—GENERATORS

We are proud to number the Mathis Yacht Building Company among the many builders of fine boats who are installing Winton Engines and Winton Generators.

Mr. Elkins' new 87′ houseboat "PILGRIM" is powered with two 80 H. P. Winton Gasoline Engines and is also equipped with a Winton Generating Set.

Winton Gasoline Engines, Winton Diesel Engines and Winton Generators have been used in many of the most conspicuously successful motor yachts launched during the past few seasons.

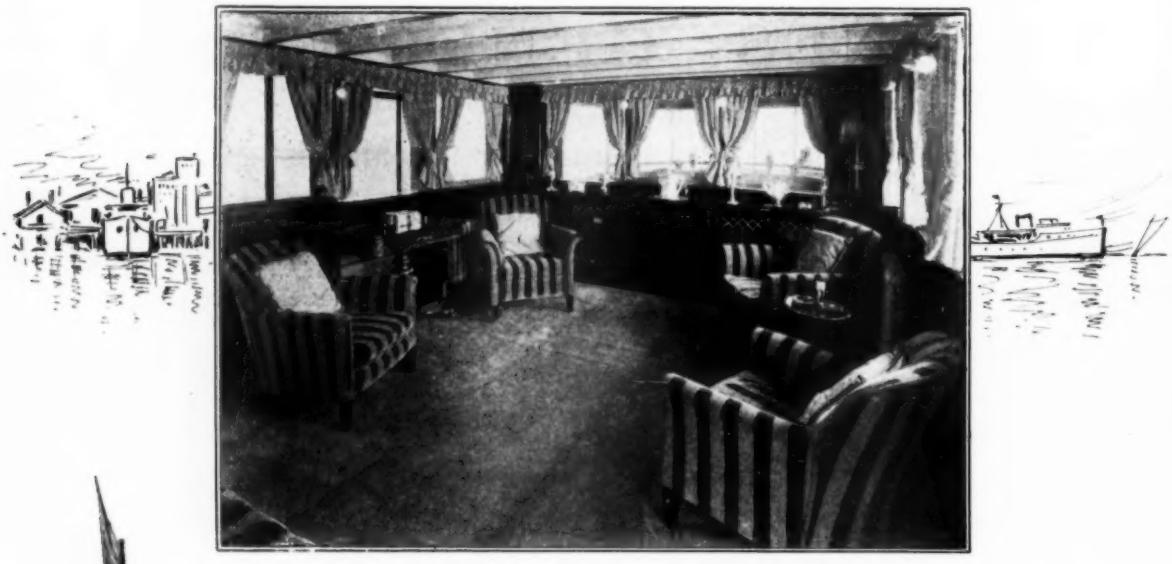
WINTON ENGINE WORKS
Cleveland, Ohio, U. S. A.



HOUSE BOATS AND YACHTS

MATHIS YACHT BUILDING CO.

The Comforts of Home Wherever You Roam



Strawbridge & Clothier

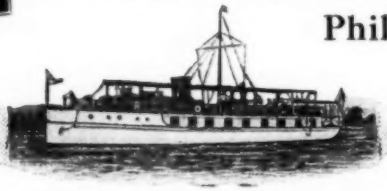
Home-like comfort—the key note of Mathis-built boats from the start, reaches its final perfection with Strawbridge & Clothier furnishings. The illustration above indicates just one phase of the comfort, the luxury, the beauty of the interiors furnished by us on the 75-ft. houseboat Amitie, Mathis-built for Charles B. Prettyman, Philadelphia. The 87-ft. houseboat Pilgrim, Mathis-built for Wm. M. Elkins, Philadelphia, and the host of other houseboats of all sizes built in the past years have received their final touch through Strawbridge & Clothier furnishings.

For auxiliary sloops such as the Nedmac, illustrated at left, and other boats where quarters were more cramped than in houseboats Strawbridge & Clothier furnishings meet the conditions without sacrificing comfort and luxury.

For details address

Contract Department, Strawbridge & Clothier

Philadelphia



HOUSE BOATS AND YACHTS

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MATHIS YACHT BUILDING CO.

MOTT MARINE PLUMBING

At Home— on a House Boat

The Mathis Yacht Building Company has set a high standard in the development of the modern Power Boat.

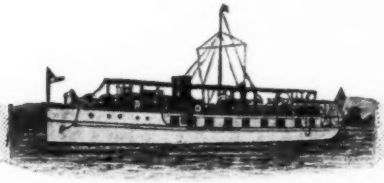
The comforts and refinements of the home have been duplicated aboard—not the least of which are to be found in the Bathroom and in

MOTT MARINE PLUMBING

A Mott equipped Bathroom on the Power House Boat "Pilgrim" — Built by the Mathis Yacht Building Co., Camden, N. J., for Mr. Wm. M. Elkins.

MOTT CO. OF PENNA.
1006 Filbert St., PHILADELPHIA, PA.

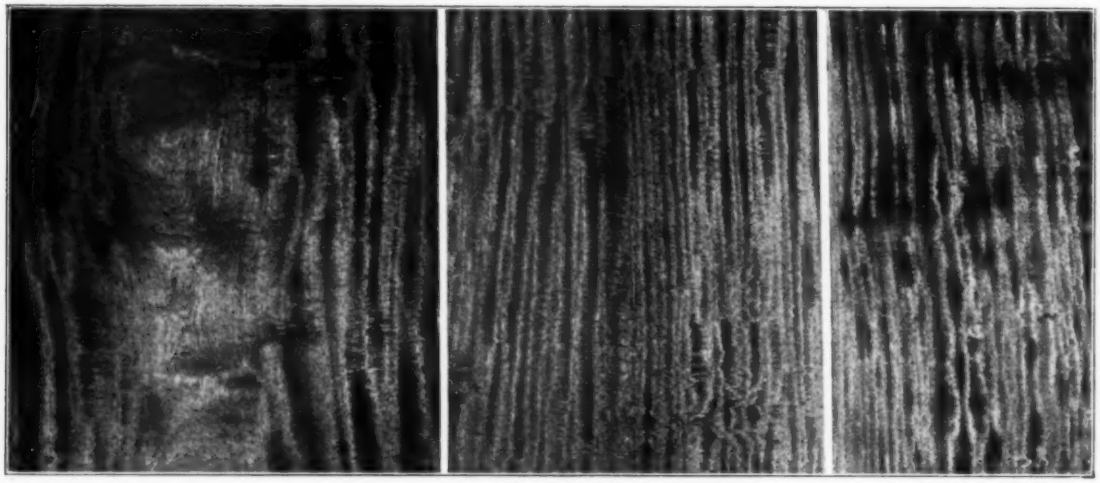
THE J. L. MOTT IRON WORKS
General Offices and Plant TRENTON, N. J.



HOUSE BOATS AND YACHTS

MATHIS YACHT BUILDING CO.

MAHOGANY—The Superb Wood for Yachts



For INTERIOR FINISH—Mahogany

From the finest ocean liners to the most luxurious houseboats and yachts, mahogany is the accepted standard for interior finish. The handsomest of all woods, with a variety of grain, beauty and depth of color that is unrivaled. Such mahogany panels as were used in the 75-foot houseboat Amitie of Charles B. Prettyman, Philadelphia, and in many other Mathis-built houseboats and cruisers are in themselves pictures with never failing interest.

For Planking, Deck-Houses, etc.—Mahogany

The best boat builders have long considered mahogany an ideal wood for yacht construction because experience has shown that it possesses the physical qualities of being light in weight yet strong. Of warping and shrinking less than other woods. And of outlasting most woods when exposed to the elements. It does not waterlog, takes varnish and paint perfectly and retains its finish, under all weather conditions. An excellent example of mahogany planked boat, with mahogany deckhouse (inside and out) is the express cruiser Lazy Lady.

The broad use of mahogany for boat construction follows precedents that are centuries old. The following extract from a letter written in 1846 by Capt. E. Chappell to Lloyds' Committee testifies to its everlasting durability:

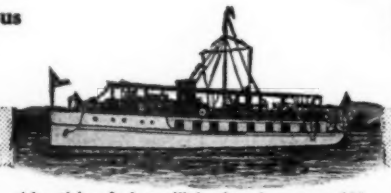
"I had seen the Gibraltar 80 gun ship broken up at the Royal Dock Yard, Pembroke. This ship was constructed entirely of Mahogany; she was built by an Englishman at Havana; and I believe she was captured from the Spaniards by Sir Geo. Rodney, in his victory over Don Juan de Langara, off Cape St. Vincent in 1780, consequently, when taken to pieces, she must have been one of the oldest ships afloat; yet all of her timbers were as sound as when they were put into her, and the whole British Navy, if I am not mistaken, are now supplied with tables made from the Gibraltar timbers."

Mahogany is not an expensive wood in the final analysis, its lasting qualities more than counterbalance its first cost. For further information consult

FESSENDEN HALL, PHILADELPHIA, PA.

Importing and Manufacturing Various Foreign Woods into Lumber and Veneers

MAHOGANY, Circassian Walnut, Padouk, English Brown Oak, Etc.

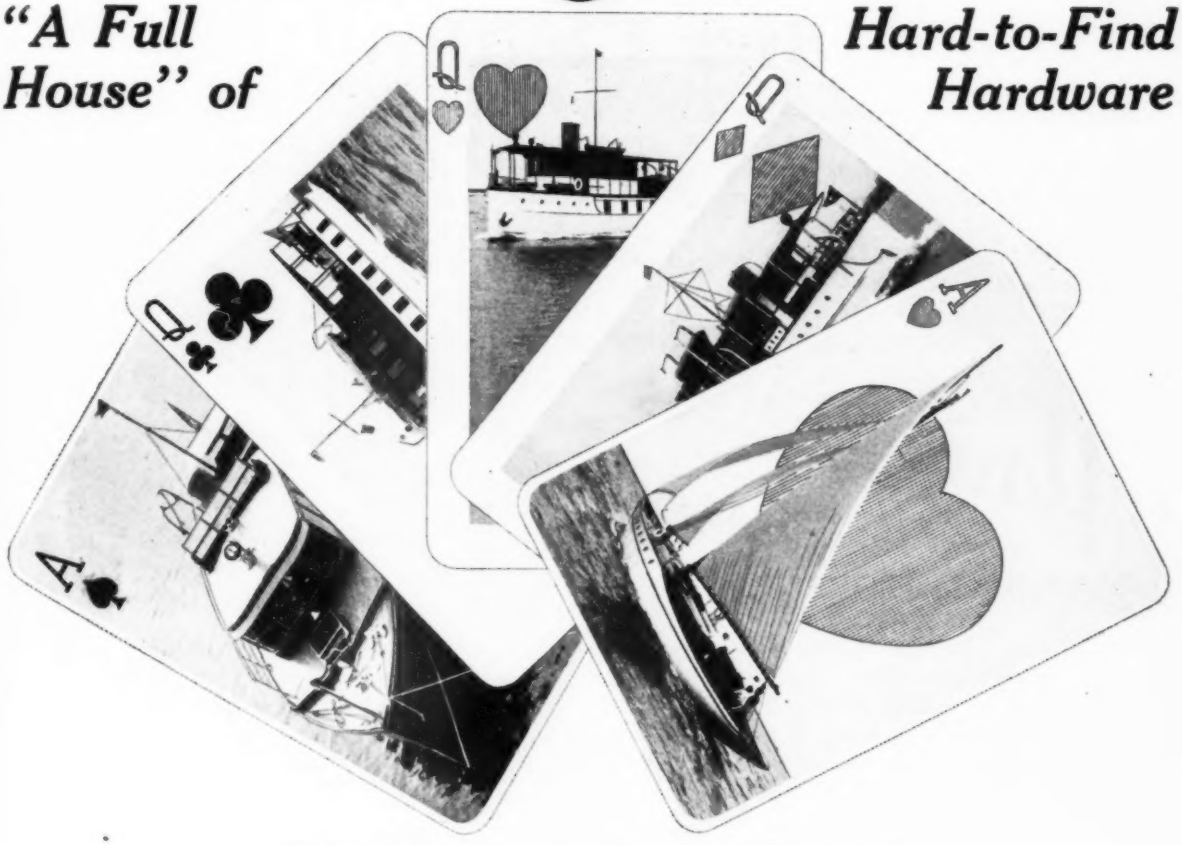


HOUSE BOATS AND YACHTS

Advertising Index will be found on page 146

MATHIS YACHT BUILDING CO.

"A Full House" of Hard-to-Find Hardware



We Make a Specialty of
HARDWARE AND TRIMS

for Houseboats, Cruisers and Yachts. For years we have supplied the Mathis Yacht Building Company, and other notable yards throughout the country.

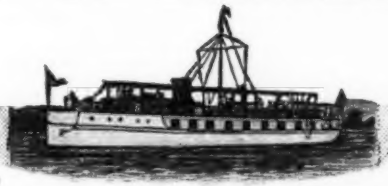
When you have a **real** hard one—something that the other fellow turns down—that is what we are looking for.

We also carry large stocks of Ship Chandlery and general supplies.

Give us an opportunity, as we pride ourselves upon the fact that "We rarely lose a customer."

THEO. C. ULMER, Inc.

Richmond St. and East Columbia Ave. **Philadelphia**



HOUSE BOATS AND YACHTS

MATHIS YACHT BUILDING CO.

One More Leading Yard

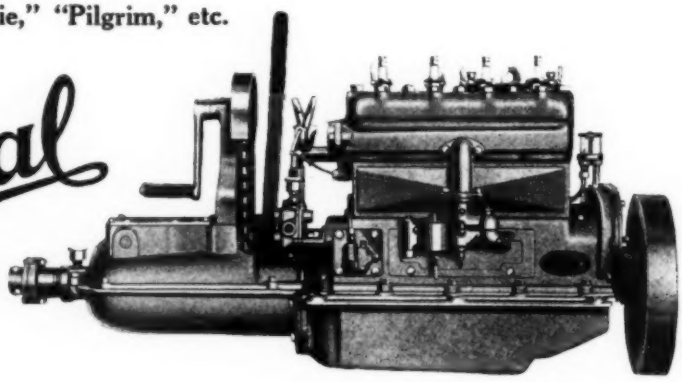
has stamped its unqualified approval on Universal Generating Sets and Marine Motors. By its action in selecting Universal equipment for four of the five distinctive boats, featured in this insert, the Mathis Yacht Building Company has expressed its recognition of the satisfaction and dependability that always accompany Universal service.

Owners of the "Snug," "Amitie," "Pilgrim," etc.
We congratulate you—
You'll find the

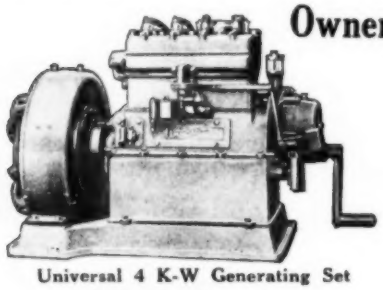
Universal

4-Cylinder
9-12 H.P.

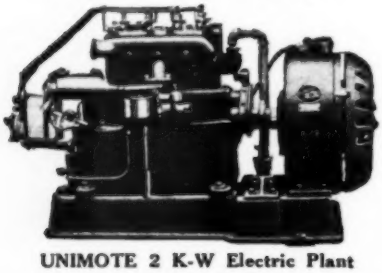
MARINE MOTORS



in your launches perfectly-designed, standard type marine motors that will give you as good service next year and years after as the first day you use them. They are guaranteed as to quality of material and workmanship and we stand squarely behind that guarantee. We ask only that those in charge of these motors use the best of lubricating oil and give them the usual care. If these are done we know that Universal Motors will give you consistent, satisfactory service that cannot be surpassed by any other on the market.



Universal 4 K-W Generating Set



UNIMOTE 2 K-W Electric Plant

Supplies dependable light and power for farms, dairies, homes, industrial plants, etc. A 4 cylinder plant—no less can be perfectly balanced.

Owners of the "Snug," "Amitie," "Lazy Lady," etc.

WE CONGRATULATE YOU—

You'll find the

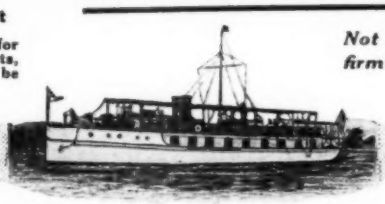
UNIVERSAL 4-K-W GENERATING SETS

compact, extremely sweet running and smooth in operation. Twenty-two years spent in design and construction of all types and sizes of generators, have made the Universal 4 K-W Generating Set the final accepted standard for marine use. Exclusive patented features make this plant unique—assure better and brighter lighting, unfailing fan-driving and dependable current for every other use to which electricity is put on your boat.

The Universal Catalog is yours for the asking. Specify whether you are interested in marine motors or generating sets, or both.

UNIVERSAL MOTOR CO., Oshkosh, Wis.

Not connected with any other firm using the name "Universal"



HOUSE BOATS AND YACHTS

Advertising Index will be found on page 146

MATHIS YACHT BUILDING CO.

"Nothing short of complete satisfaction"

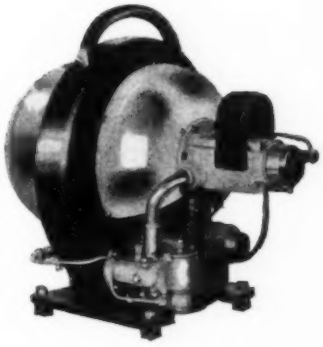
the watchword of the Mathis Yacht Building Company—has led to the use of **Edison Batteries and Smith-Meeker Engineering Service** on practically every recent notable boat built by them.

That their choice has been the right choice, is shown by their report that complaints on electrical equipment have become scarce as icebergs in the Tropics.

Is your electrical equipment satisfactory?

If not, let us show you how Edison Batteries—plus Smith-Meeker Engineering Service—will make it so.

We specialize in Marine Electrical Engineering and are equipped to give complete service to the yachtsman or builder



Homelite

Homelite, the smallest complete generating set made. Ideal equipment for small cruisers. Capacity ½ k.w. Weight 100 lbs. Made in 12 or 32 volt

We are glad to serve naval architects, builders and boat-owners

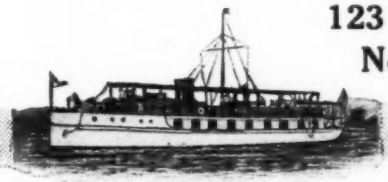
SMITH-MEEKER ENGINEERING CO.

Electrical Engineers and Specialists on

Searchlights, Fixtures, Switchboards, Marine Equipment of all Kinds

Distributors for
Edison Storage Batteries
Winton Generating Sets
Homelite and Unimote Generating Sets

123 LIBERTY STREET
New York City, N.Y.

HOUSE BOATS  AND YACHTS

MATHIS YACHT BUILDING CO.

TIGHT DECKS

yet with all the pliability and elasticity—that necessary ever-present give and take—that any *good* deck must have, is the attribute possessed by every Mathis-Built Houseboat in which the deck seams are filled with

KUHLS'

ELASTIC SEAM-COMPOSITION TRADE MARK

It is only natural that the builders of these boats, mindful of the long-time service they are designed to give, should select this perfect seam-sealing composition. Its use assures that resilience that takes up the wringing and twisting in the seaways, that compensates for the swelling and shrinking resulting from alternate wetting and drying and changes in temperature.

First Filling Lasts for Years

While we assure every boat builder who uses **Kuhls' Elastic Seam Composition** that one filling will last from eight to twelve years, disinterested groups of architects and engineers have inspected fillings of it made thirteen years previously and have found them practically equal to new. This under conditions much more rigorous than it is ever required to meet even in extraordinary marine service.

In all places where a tight joint is desired, there is no other elastic compound that fills the bill like **Kuhls' Elastic Seam Composition.** It becomes semi-hard but never brittle, adhering closely to the sides of the seams, and retains all its original elasticity through years of hard service.

In five colors: White, Gray, Yellow, Black and Mahogany. Write for Folder and Price List on this and the other protective marine specialties made by KUHLS.

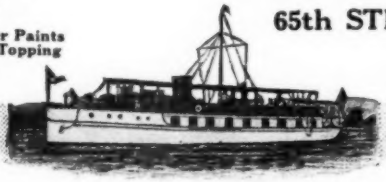
ALSO

And These Other Distinctive Kuhls' Products
Elastic Flat Yacht White
Elastic Gloss Yacht White
Elastic Trowel Cement
Elastic Deck Varnish
Elastic Bright Green and Red } Copper Paints
Boot-Topping

H. B. FRED KUHLS

Sole Manufacturer. Est. 1889

65th STREET and 3rd AVENUE
NEW YORK

HOUSE BOATS  AND YACHTS

Advertising Index will be found on page 146

MATHIS YACHT BUILDING CO.

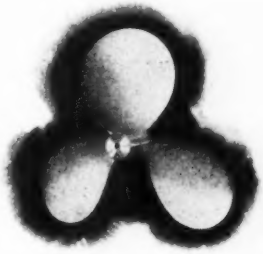
Cap'n Allswell says:

"A boat without a good propeller's like a fish without fins!

"KNOWIN' this, the Mathis people are considerable choosey about what they fit out the business ends o' their boats with. That's one o' the reasons why you can't beat a Mathis for top speed when needed an' smooth ridin' all the time.

"So, it's a whale of a lot o' satisfaction to me to sit back an' reflect that every last craft in this whole Mathis announcement is driven by a Columbian Bronze Propeller."

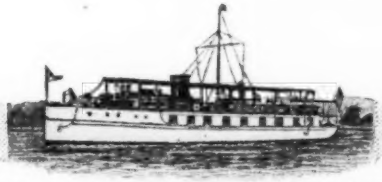
Equip Your Boat With
COLUMBIAN
BRONZE PROPELLERS



if you would realize true pleasure and economy. Made of special high-grade manganese bronze, perfectly cast and scientifically pitched to give you the most power per gas mile without vibration.

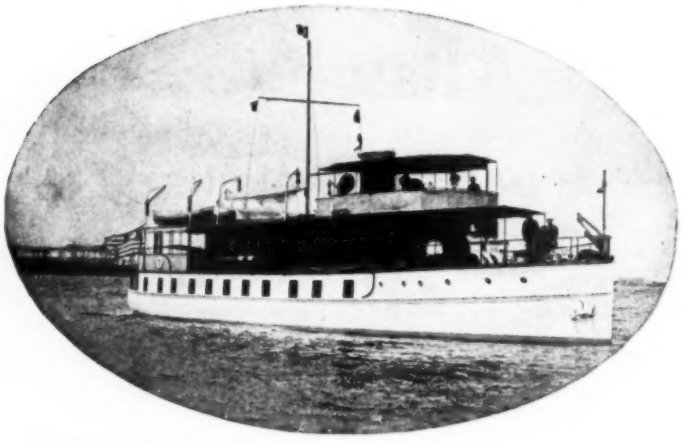
Send for the Columbian Booklet

The Columbian Bronze Corporation
204 N. Main St., Freeport, Long Island, N. Y.
For New York City Sales Only: 44 Third Ave.



HOUSE BOATS AND YACHTS

MATHIS YACHT BUILDING CO.



Marine Engineers since 1865

Outfitters and makers of Ships Cooking Apparatus since 1865

* * *

A personal talk to present and prospective yacht owners

FROM 1894, at which time this business was started, until 1900 our operations were chiefly confined to the equipment of Steam Vessels, both merchant and pleasure type. Foreseeing the introduction of the large motor yacht, we designed a range with a circulating system that would insure to the owner the same conveniences in the matter of bath and lavatory service that he was accustomed to enjoy on his steam craft.

The Galley Range was, of course, the only medium by which the supply of hot water was to be obtained. Few boats (except the steam yachts) had running water, and practically none had hot.

We built and installed several outfits and then approached the late A. Cary Smith, who was then at work on the designs of the "ELMINA" for an order for an outfit for this craft. "Why, that is just what I have been wanting for years," said he, after looking over our plans, "and these 'Divine Right' ship stove men here in New York say, 'It can't be done'."

We could not lay any special claims to Divine inspiration, so far as our connection with the trade was concerned, but before we left the office, he had phoned to a reference we had given, who advised that he give us the order and then forget it, and leave the details to us.

Well, that is just what the "old man" did, and he said he never regretted it. We were one of his "honey boys" after that, and our record has been an unbroken one from that time, so far as important marine jobs are concerned, for what we did for him we have done for many others.

"Mathis-built boats" have figured prominently in our list of patrons, as have those of other builders, and it is with a sense of satisfaction, that we feel that we have been able to contribute to the comfort of those "who go down to the sea in ships" whether for work or pleasure.

Don't you think your requirements would be safe in our hands?

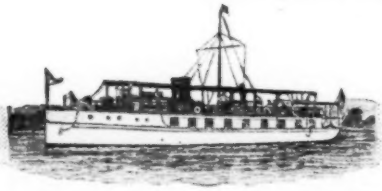
A 5 ft. WebbperfectioN Outfit

Elisha Webb & Son Co.

136 S. Front Street

Philadelphia, Pa.

Exclusive makers of WebbperfectioN Ranges
System patented May 1, 1906



HOUSE BOATS AND YACHTS

Advertising Index will be found on page 146

MATHIS YACHT BUILDING CO.

Two New Type Express-Cruisers and Auxiliaries

Auxiliary Sloop "Nedmac"
built for Mr. Albert C. Middleton, Moorestown, N. J.

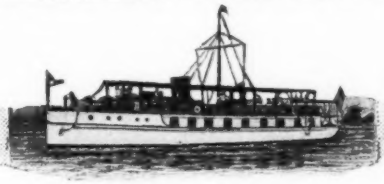
FOR cruising at sea or even in the shallowest Southern waters the "Nedmac" (shown below) is an ideal combination of sail and motor power, of safety, speed and economy of operation. Handled by a single paid hand. Speedy.

Overall length 55 ft. 6 in. Waterline length 39 ft. Beam 15 ft. Draught 3 ft.

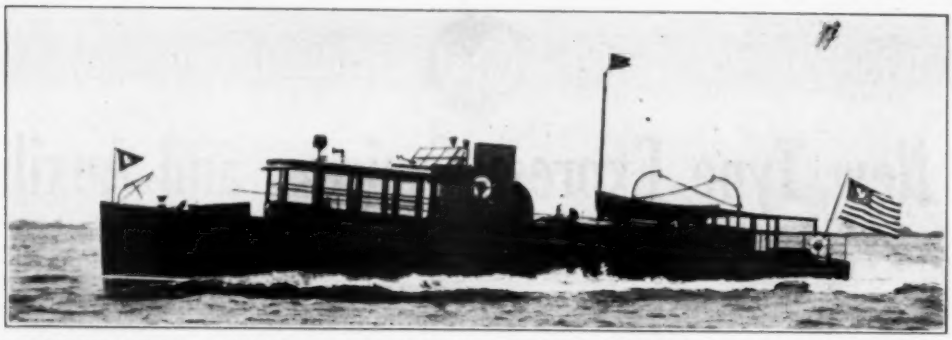
(Above) 67-ft. Express Cruiser "Lazy Lady"
Designed by Thos. D. Bowes, M. E.
Built by Mathis Yacht Building Co., for Mr. Robert Wolstenholme, Philadelphia.

A UNIQUE mahogany-planked boat, of handsome lines, combining speedboat advantages even in shallow waters, with comfort and seaworthiness on extended cruises. Makes 30 miles an hour—remarkable for its lack of roll even in a heavy beam sea, and for its freedom from taking solid water aboard forward. Can be driven 24 miles per hour in only eight feet of water without dragging a sea.

MATHIS YACHT BUILDING CO.,
Coopers Point, Camden, N. J.

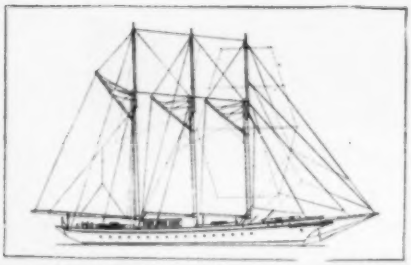


HOUSE BOATS AND YACHTS



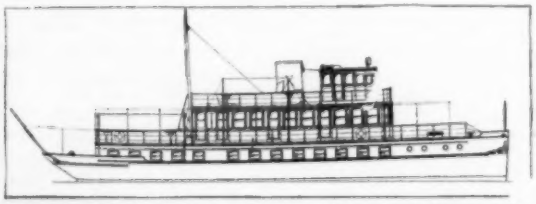
LAZY LADY—a 67-ft. Bowes designed express cruiser, built in the Mathis yards for Mr. Robert Wolstenholme. A combination never produced before of sea-going cruiser, and high-speed express boat, yet capable of high speed in shallow waters.

Designing Boats That Lead

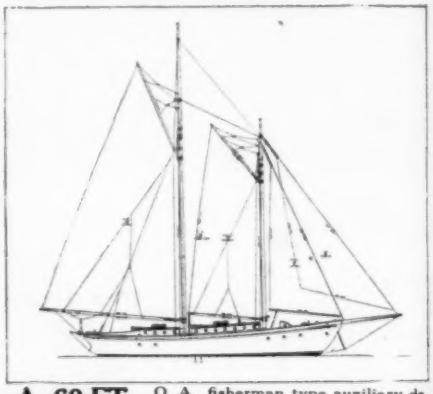


A 130-FT. sea-going auxiliary schooner designed for Dr. A. C. Muttart.

has been our specialty since 1905. A vast fleet, built in yards all over the country from our designs, testifies to the superiority of our complete set of plans. We supply the details of all parts—joinery, plumbing, wiring, lines, etc.—which, in addition to the careful supervision we give the construction of our boats, enables us to assure you of a complete and perfect yacht, and to absolutely guarantee speeds.



THE 97-FT. twin screw power-houseboat designed for Mr. T. D. Cardeza. Among our motor yachts are many successful Bermuda and Havana racers.

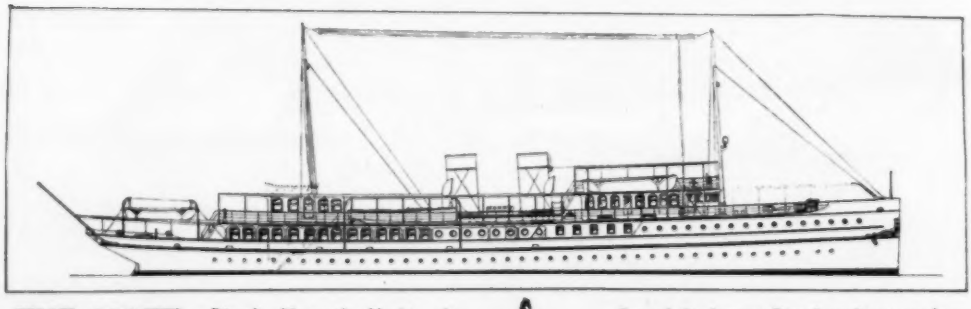


A 60-FT. O. A., fisherman type auxiliary designed for Col. E. M. Chance. For years we have made a specialty of auxiliaries.

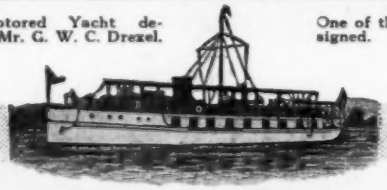
THOMAS D. BOWES, M. E.

NAVAL ARCHITECT AND ENGINEER

Lafayette Bldg., 5th & Chestnut Sts., Philadelphia, Pa.



THE 225-FT. Diesel Motored Yacht designed for Mr. G. W. C. Drexel. One of the largest Diesel yachts ever designed.



HOUSE BOATS AND YACHTS

Advertising Index will be found on page 146

Peerless

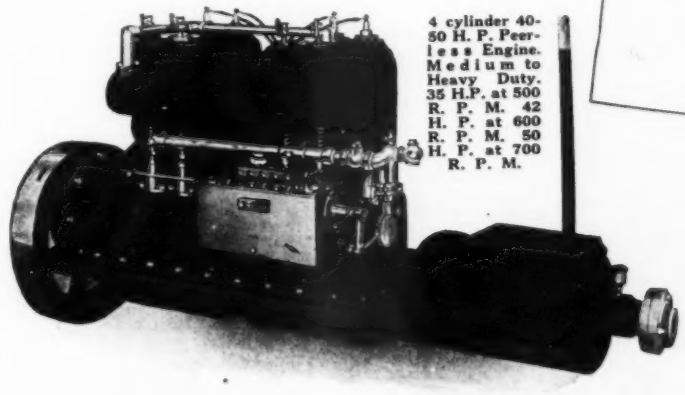
"The Engine That Makes Good"

Raft of 40,000 cedar posts towed by a 40-50 H. P.
Peerless Marine Motor, by H. H. Derusha, St. Ignace, Mich.

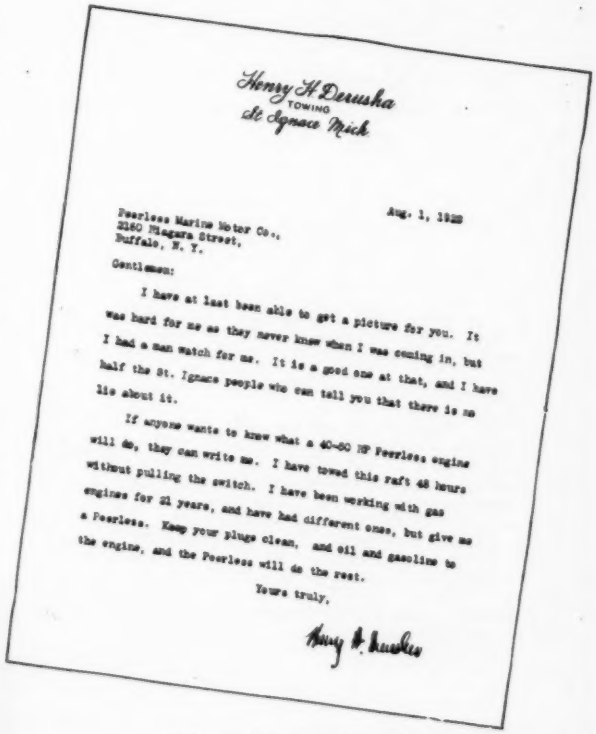
IF you want to know what a Peerless Marine Motor will do, just glance at the raft of 40,000 cedar posts shown above. Mr. Derusha says he has "towed this raft 48 hours without pulling the switch". That calls for constant power and absolute dependability—the kind that means steady service and steady profits for the work boat owner.

Few marine motors are called on to perform such heavy service as this. Peerless motors have found more than their share of the hard jobs. They never fail to sustain their reputation as "the motor that makes good".

Practical men like Mr. Derusha, who have worked with gas engines for many years, appreciate the reliability, steady service and low cost of Peerless motors. Low in price and inexpensive to run.



4 cylinder 40-50 H. P. Peerless Engine. Medium to Heavy Duty. 35 H.P. at 500 R. P. M. 42 H. P. at 600 R. P. M. 50 H. P. at 700 R. P. M.



Henry H. Derusha
TOWING
St. Ignace Mich.

Aug. 1, 1922

Peerless Marine Motor Co.,
2160 Niagara Street,
Buffalo, N. Y.

Gentlemen:

I have at last been able to get a picture for you. It was hard for me as they never know when I was coming in, but I had a man watch for me. It is a good one at that, and I have half the St. Ignace people who can tell you that there is no lie about it.

If anyone wants to know what a 40-50 HP Peerless engine will do, they can write me. I have towed this raft 48 hours without pulling the switch. I have been working with gas engines for 21 years, and have had different ones, but give me a Peerless. Keep your plugs clean, and oil and gasoline to the engine, and the Peerless will do the rest.

Yours truly,

Henry H. Derusha

We build Peerless Motors in several sizes from 5 to 50 H.P. for fishing boats, runabouts, cruisers and work boats. They are making good in hundreds of successful boats.

Write today for latest catalog and prices

PEERLESS MARINE MOTOR CO.
2160 Niagara Street Buffalo, N. Y.

Export Conditions and Prospects

(*Continued from page 39*)

habituated to regarding it as costing him 10, 12 and 15 francs. He instinctively looks on prices in American dollars from a new point of view and is accustomed to contemplate buying at new values when at first he was quite stunned by the reversal of all of his old ideas. The same thing is true in almost all countries of the world and since merchants are to continue in business they are prepared to buy at the new values.

It will be interesting to review the general course of our export trade as officially reported by the Bureau of Foreign and Domestic Commerce of the Department of Commerce for the years 1913-1921 as applying to exports of motor boats, exports of steam marine engines (excepting turbines), and exports of internal combustion gasoline marine engines. This table follows, and to it are added exports for the first six months of 1922 (January to June), and in the latter period, for the first time, our Government differentiates exports of Diesel and other heavy oil internal combustion marine engines. The figures in this table are not exactly comparable, since the statistics for 1913 to 1917 were for fiscal years (ending June 30 of each year), while those for the years 1918 to 1921 were for calendar years. However, the aggregates afford an interesting subject for study and it is probable that a good many people will be surprised to know the actual values exported in the year 1921—the year characterized by sluggish trade and by prices that were constantly being deflated, when not a few American manufacturers declared that there was no export trade.

(Fiscal years 1913-1917; calendar year 1918-1921):

	Motor Boats		Internal Combustion Engines, Gasoline Marine		Internal Combustion Marine Engines, Diesel and other heavy oil	
Year	No.	Value	No.	Value	No.	Value
1913	516	$768,523	10,940	$1,586,926	..	....
1914	400	519,584	11,606	1,599,364	..	....
1915	164	273,516	5,907	753,476	..	....
1916	264	800,231	8,002	3,139,955	..	....
1917	230	917,438	9,815	2,204,114	..	....
1918	206	3,663,912	5,483	2,790,833	..	....
1919	140	358,851	10,485	4,363,538	..	....
1920	298	1,008,872	9,615	3,283,032	..	....
1921	181	1,007,620	4,016	1,406,291	..	....
1922*	54	79,583	2,292	473,747	22	9,307

* First six months only.

Full figures for American exports of internal combustion gasoline marine engines by countries for the past four years compared with exports in 1913 accompany this article, for which thanks are due to the Bureau of Foreign and Domestic Commerce in supplying advance proofs of the volume of Foreign Commerce and Navigation, which has not yet been published and put on sale, also a table showing exports by countries of gasoline marine engines from January to June of the present year, 1922.

A review of these tables should prove instructive as to the course of trade with those countries of the world which have been our large and regular customers for gasoline marine engines since 1913.

It will be noted that our exports in 1921, our dull year, were very much larger than they were in 1913 to England, Spain, Mexico, Cuba, China, Japan and the Philippine Islands.

It will also be noted that our exports in 1921 to Italy were still as large as in 1913 and that France was almost as large a buyer from us, while there were considerable increases in exports to such minor markets as Chile, Peru and British India.

There were serious drops in our export trade to some of our important foreign customers, the Netherlands, for example, Argentina, Brazil, and Australia. In the case of Sweden there appeared in 1921 what seemed to be a tremendous drop in trade, but Sweden seems to be coming back, since we exported almost as many gasoline engines to that country in the first six months of 1922 as we did in the whole twelve months of 1921.

While there may be adequate reasons existing locally in some of the countries where we have apparently lost trade yet it is probable that such conditions are temporary only. Our trade in gasoline engines with Australia, for example, has always been fluctuating, and if the new Australian tariff does operate temporarily to restrict importations, still that has been the fact before in the case of Australia, and for tariff as well as for other reasons, although trade has rebounded with a readjustment of men's minds to new conditions. However, the fact of loss of trade in some foreign markets may very well prompt a manufacturer of gasoline engines to look rather seriously into his own prospects in those markets and determine whether he has the best arragements there to get all that is possible out of those markets, or whether new plants, more aggressiveness, more cooperation with the local trade, may not result in improved business.

Very interesting indeed are the big increases in our exports of gasoline engines to Mexico where, even in the dull year of 1921, our figures were larger than in any previous year, and great increases are shown in shipments to both China and Japan, which very closely approximate the record year of 1919 and show a wonderfully encouraging trend of trade to those markets. English trade still seems to continue good, as does the Italian trade despite Italy's troubles. Indeed, there is little cause for discouragement in the case of any of our large regular foreign customers. The sore spots seem to be Sweden, Brazil and Australia.

From another point of view, an examination of our export shipments to foreign countries covering an extended period of years may offer hints as to new markets possible for development and may suggest the inquiry as to what efforts have been made by manufacturers adequately to follow up suggested opportunities in those markets.

Of course, we are not now shipping any gasoline engines, or anything else for that matter, into Russia, and the territory of Turkey in Asia is not a particularly inviting market at present, but we have in the course of the past eight or ten years now and then shipped a few gasoline engines into some countries, while we have not shipped any at all during 1921 or during the first six months of the present year. For example, the following countries appear as having received each one or more gasoline engines from the United States in the course of previous years but none at all for a year and a half past: Jugoslavia and Albania; French Guiana; Paraguay; French Indo-China; Persia; Madagascar; Canary Islands; Belgian Kongo.

The question may very well be asked whether, if a year or two or three years ago, we could ship an engine or two to one of these markets, there exist any good and sufficient reasons why we have not been shipping any more engines since that date; whether there is not an opportunity to use some engines in those markets; or whether the fault may not lie with the American manufacturer in a failure to follow up a suggested opportunity. Does the manufacturer who ships a gasoline engine to Madagascar in 1918 and another engine there in 1919, but has since shipped nothing at all, know what reception his engines met with, whether the customers were even able to operate them? Has the manufacturer tried to utilize these engines as samples and build up on the basis of those samples, on the ground (or rather on the water), actually operating and available for inspection by others, a larger trade, either directly on his own account or through hearty, ambitious cooperation with some agent in the field? Have the engines merely been shipped as they were ordered and then forgotten? Has the hint been recognized that if one engine can be sold, twenty or a hundred engines may perhaps be sold?

(Fiscal years 1913-1917; calendar years 1918-1921):

GASOLINE MARINE ENGINES

Countries that are largest regular customers

	1913	1914	1915	1916	1917	1918	1919	1920	1921
France	$22,363	$22,332	$8,661	$6,620	$137,384	$348,498	$120,699	$50,702	$17,680
Italy	15,591	23,749	9,072	83,978	89,007	570,274	369,841	45,452	20,034
England	55,191	72,952	57,639	223,539	93,173	137,653	217,658	211,345	59,417
Netherlands	43,586	45,556	16,387	34,288	57,457	.....	70,316	135,518	29,302
Spain	4,097	8,646	7,100	7,997	27,916	18,660	236,400	34,748	41,086
Sweden	67,829	64,526	8,964	40,573	63,275	*10,715	86,162	88,067	9,666
Mexico	64,047	38,902	13,193	30,255	35,458	68,329	230,981	246,693	264,098
Cuba	36,883	30,393	29,027	26,344	45,776	74,833	102,656	248,629	81,682
Argentina	73,358	70,058	11,327	14,101	30,788	40,004	106,094	100,976	37,334
Brazil	88,429	62,882	17,428	25,862	26,492	15,823	69,749	81,142	5,432
Chile	2,599	5,942	3,821	3,912	13,288	39,625	275,939	43,684	9,343
Peru	7,547	14,835	5,052	8,537	38,316	81,896	76,646	165,830	25,358
China	11,577	19,330	8,280	7,618	16,660	83,924	79,597	60,867	59,867
British India	8,146	12,532	18,208	15,679	26,166	76,684	107,675	35,721	23,463
Japan	15,316	16,466	3,548	8,386	10,962	65,836	108,796	175,142	36,164
Australia	134,803	150,214	85,517	96,498	87,120	69,410	84,289	70,719	43,796
Philippines	9,302	22,915	20,137	4,319	32,522	52,242	316,169	120,397	42,338

* Fiscal year ending June 30, 1918.

(*Continued on page 129*)

How to make 25c do the work of $1.40

A "spare" charge for the Magno Storage Battery costs a quarter. It will not only outlast any other type of storage battery by several years but will provide current equal to two dry cells and will last longer than two such sets of dry cells. Thus, for the 25c "spare" Magno charge you get the same as $1.40 worth of dry cells. You save $1.15.

As you know, the Storage Battery Magno is completely recharged by unscrewing the cap and inserting a "spare" electrode. Not even a tool is needed. By keeping a "spare" on hand your Magno will never run down. It is a practical, positive, efficient battery for motor ignition, radio and cabin lights. It is the lowest-cost-to-operate battery made and will last for years.

Write us today for descriptive folder M3-9. Learn how the Magno will save you considerable battery money and eliminate battery trouble.

The MAGNO is ideal for the following:

Radio "A" Batteries
Gas Engine, Truck, and Tractor Ignition
Marine Engine Ignition, Cabin and Running Light
Door Bells and Annunciators
Portable Marine Lamps
Portable Lamps for Police & Fire Departments
Dental Engines
Medical and Dental Appliances
Local Telephone Switchboards
Low Voltage Motors
Laboratory and School Work
Fire, Police and Burglar Alarms
Electric Clocks—Factory Time Clocks
Telephone Train Despatching
Telegraph Systems
Interior Fire Alarm and Sprinkler Systems
Mine Signals
Electric Railway Signals and Crossing Bells
Telephone Annunciating Amplifiers
Christmas Tree Lighting Outfits
Electrical Toys
For any other application where a battery of any type is used.

MAGNO STORAGE BATTERY CORP., Aeolian Bldg., New York City

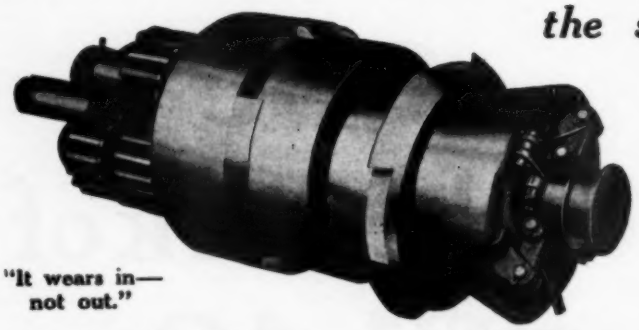
STORAGE BATTERY MAGNO

MULTI-CONE

the smoothest, most powerful, durable and trouble-proof marine clutch

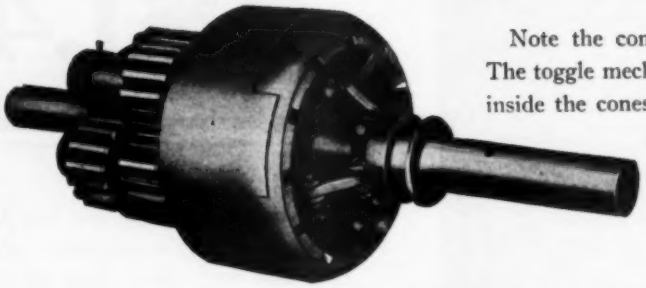
is used only in the

STANDARD Reverse Gear



"It wears in—not out."

The Secret of Multi-Cone efficiency lies not only in the great friction surfaces of the big cones, but in the fact that these surfaces are at the point of greatest diameter. This increases their leverage and thereby increases the holding power of the clutch.



Note the compactness of this clutch. The toggle mechanism is out of the way, inside the cones. The Multi-Cone picks up the load smoothly and releases instantly. Easy to adjust or take apart.

The 1922 Standard Reverse Gear with the new Multi-Cone Clutch is keeping our factory busy day and night to meet the demands of boatmen. Old timers know that the satisfaction any gear can give depends on the efficiency of its clutch. And everybody recognizes in the Multi-Cone the most practical design possible for a marine clutch.

And add to this a perfect reversing mechanism, running in oil and completely enclosed in a handsome oil-tight case. No wonder the Standard is so popular.

Model "C" Standard Multi-Cone for

100 H. P. Hall-Scott

Entirely Enclosed

$100 COMPLETE

The Standard Midget

The smallest reverse gear made. Transmits ½ H. P. per 100 R. P. M. A real Standard with Timken roller bearings and Multi-Cone Clutch.

Write to-day for description and prices, giving complete details of your boat and engine so we can recommend the proper size gear for your outfit.

STANDARD GEAR CO.

2819 Brooklyn Ave. Detroit, Mich.

Advertising Index will be found on page 146

NIAGARA "SPECIAL"

Foremost in Quality and Value

IN the new school of marine engines you will find the NIAGARA "SPECIAL" right in the front rank in every detail of design, construction and service. A highly refined, 4-cylinder, 4-cycle unit, power plant developing 9 to 15 H.P., with built-in rear starter, reverse gear, lubrication system, etc. For OPEN BOATS, RUNABOUTS and SMALL CRUISERS.

Standardized production by modern manufacturing methods enables us to produce this high-grade four-cycle motor at about the same prices as an old style two-cycle engine of equivalent power. The NIAGARA "SPECIAL" is immeasurably superior in easy starting, smooth running, fuel economy, flexibility, reliability and freedom from vibration or operating troubles.

Other Niagara Motors up to 120 H. P.

The NIAGARA E-2 is 12-14 h.p., 2-cyl., 4 cycle, for FISHING AND HEAVIER SMALL BOATS.
The NIAGARA E-4 is 20-30 h.p., 4-cyl., 4 cycle, for FISHING, LIGHT CRUISERS AND SPEED RUNABOUTS.

The NIAGARA D-4 is 40-60 h.p., 4-cyl., 4 cycle, for COMMERCIAL BOATS, TUGS, ETC.
The NIAGARA D-6 is 60-120 h.p., 6-cyl., 4 cycle, for CABIN CRUISERS, MOTOR YACHTS, PASSENGER AND SERVICE BOATS.

Write today for latest catalog and prices mentioning size and type of your boat

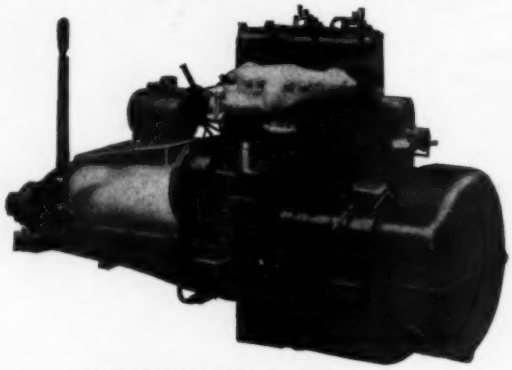
ENGINE AGENTS: Some Valuable Territory Now Open. Write or Wire.

NIAGARA MOTORS CORPORATION, 206 NIAGARA BLVD. DUNKIRK, N. Y.

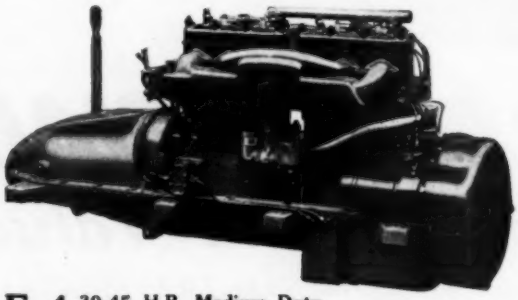
Scripps

Famous the World Over

Even before the SCRIPPS powered 35 ft. Cruiser "Detroit" made its memorable trip from Detroit to Petrograd, (the first ocean crossing by a gasoline driven craft) SCRIPPS motors have been internationally famous. In every sea, in every clime, they are delivering that high order of service that for 17 years has made SCRIPPS synonymous with perfect motor performance. A large portion of the SCRIPPS output goes overseas, not in a succession of isolated sales but to regularly established dealers, giving cooperative service to SCRIPPS owners in almost every port.



D-2 10-12 H.P. Medium Duty
15-18 H.P. High Speed
Including Electric Starter **$650**



E-4 30-45 H.P. Medium Duty
45-70 H.P. High Speed
Including Electric Starter **$1250**

E-6 40-60 H.P. Medium Duty
65-100 H.P. High Speed
Including Electric Starter **$1750**

This wide distribution of SCRIPPS engines is the result of building into every SCRIPPS motor, whether used at home or abroad the quality we term "BUILT-IN-SERVICE". This insures uninterrupted motor performance and enjoyment in any class of service, in any type of hull.

Note the compact construction—the accessibility—the convenient arrangement of all equipment—the large, correctly balanced crankshaft, the automatic pressure lubrication to all bearings, even to reverse gear (no grease cups)—two unit starting and lighting—the double ignition for speed and safety and the exclusive SCRIPPS hot spot manifold that insures perfect carburetion, power, economy and freedom from crankcase dilution.

Two, four and six cylinder models, medium duty and high speed, gasoline or kerosene—a motor for every purpose—cruiser—runabout—auxiliary or commercial.

SCRIPPS MOTOR COMPANY
5819 Lincoln Avenue
Detroit, Michigan

"Every Moving Part Enclosed"

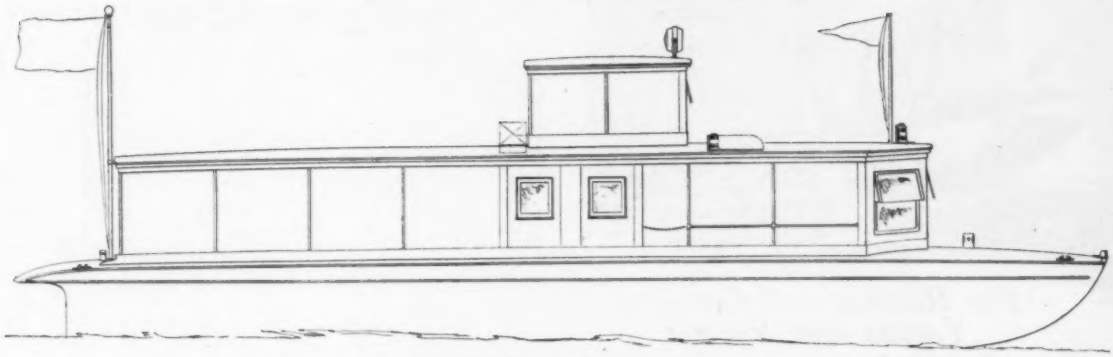
Advertising Index will be found on page 146

Inverted V-bottom and Surface Propeller Boats.

SEA SLED

Hickman Patents in all countries.

Trade Mark Reg. U. S. Pat. Off. Trade Mark Reg. Canada.



47′ x 12′ Sea Sled 20 passenger model

Fast Passenger Carrying Sea Sled For River Service

After years of experimenting with different types of motor driven craft in the endeavor to establish fast, reliable, economical transportation on the rivers of Colombia the Transportes Rapidos Fluviales have adopted Sea Sleds to perform that work.

This new model, illustrated above, is to carry twenty passengers and their baggage, a total weight of approximately 5500 lbs., at speeds greater than 30 miles an hour in very shallow waters.

Powered with four Sterling motors, model GR6, this boat is one more example of the remarkable efficiencies offered in Sea Sleds. That combination of the Sea Sled type of hull and surface propellers makes this feat possible of accomplishment.

The ability to carry weight at speed with perfect comfort and safety added to the weedless feature of surface propellers makes the Sea Sled the logical boat for your use, whether that use be commercial or pleasure. Powered Sea Sleds are available in all sizes and types, from the 24-foot standardized runabout to the large, fast cruisers and commercial craft.

A word from you telling your requirements will bring complete information and recommendation of the Sea Sled for your purpose.

SEA SLED DINGHY

In this, their first season, these smallest of the Sea Sled family have met with unprecedented demand and favor. Greatly increased production allows of prompt shipment from stock. Built in three sizes, 8′6″, 11′ and 13′ in length, these boats excel for the yachtsman, vacationist, fisherman, camper, and for outboard motors. Complete descriptive and illustrated literature promptly and gladly forwarded on request.

The Sea Sled Company, Ltd., West Mystic, Conn.

For Racing and Cruising Yachts and Vessels

Increases speed, saves fuel and large expense bills. A hard and peculiar slippery finish which lasts a long time. It pays for itself many times over by eliminating costly repairs, scraping and repainting work. It is a powerful wood preservative and anti-fouler, and is equalled only by Copper Sheathing as a protection against Teredos.

MARBLEHEAD FULL AND SEMI-ENAMEL YACHT WHITE FOR TOPSIDES

Advice and consultation free on all painting and repair work.

STEARNS-McKAY MFG. CO
MARBLEHEAD MASS. U.S.A.

SYRACUSE REVERSE GEAR

The Only Reverse Gear with Built-in Rear Starter

A better gear that costs you less money. An all enclosed gear that includes a high-grade elevated rear starter. Quality and price considered, the best reverse gear value offered to-day.

The only reverse gear on the market that includes a rear starter built in as an integral part of the gear.

All ready to be attached to your engine with minimum trouble and expense for installing. Open gears at correspondingly lower prices.

For 100 h.p. Hall-Scott

You will find the Syracuse Gear ideally suited for the purpose, and the price is right. We build Syracuse Gears to sizes from 10 H.P. to 100 H.P.

Write today for catalog and prices

Syracuse Gear Co.
Syracuse, N. Y.

Export Conditions and Prospects

(*Continued from page 122*)

The manufacturer who ships even one engine to a new territory cannot regard that as an isolated bit of business, finished as soon as the engine is shipped and he has got his money. He may very well be encouraged to spend several times the amount of money he received for that engine in utilizing the hint which he has received and in studying the best possible ways of getting all possible trade out of that special market.

EXPORTS OF GASOLINE MARINE ENGINES
January to June, 1922, inclusive

	No.	Value
Azores and Madeira Islands	1	$296
Belgium	65	5,911
Denmark	7	1,041
Finland	8	798
France	52	6,765
Greece	2	720
Malta, Gozo, etc.	3	929
Iceland and Faroe Islands	2	140
Italy	31	3,952
Netherlands	106	10,750
Norway	28	3,080
Spain	98	29,302
Sweden	33	7,197
Switzerland	4	901
England	320	39,038
Scotland	14	1,726
Ireland	8	765
Canada—		
Maritime Provinces	37	11,044
Quebec and Ontario	502	110,340
Prairie Provinces	61	14,851
British Columbia and Yukon	60	11,249
British Honduras	7	2,430
Costa Rica	2	578
Guatemala	2	1,955
Honduras	7	2,325
Nicaragua	1	295
Panama	4	5,266
Salvador	1	79
Mexico	43	17,046
Newfoundland and Labrador	10	2,427
Bermuda	15	2,195
Other British West Indies	6	8,663
Cuba	38	10,383
Haiti	3	798
French West Indies	1	100
Argentina	48	6,231
Brazil	4	3,339
British Guiana	13	2,112
Colombia	9	7,944
Ecuador	2	1,410
Peru	4	4,291
Uruguay	1	438
Venezuela	12	8,431
British India	7	5,916
Straits Settlements	2	170
China	10	5,109
Hongkong	4	2,624
Ceylon	1	142
Far Eastern Republic	10	6,685
Java and Madura	5	1,695
Japan	356	65,780
Philippine Islands	14	1,257
Siam	16	3,943
Australia	154	20,263
New Zealand	15	3,833
British Oceania	1	71
Egypt	4	842
British East Africa	16	3,516
British South Africa	1	775
British West Africa	1	105
Algeria and Tunis	5	1,110
Morocco	1	380
	2,292	$473,747

EXPORTS OF MOTOR BOATS
January to June, 1922, Inclusive

	No.	Value
Greece	1	$2,200
Canada—		
Quebec and Ontario	15	7,868
British Columbia and Yukon	2	4,929
Prairie Provinces	1	703
Honduras	1	600
Nicaragua	1	792
Mexico	4	9,641
Bermuda	2	5,700
Cuba	2	1,076
Colombia	3	9,344
Venezuela	2	10,290
Argentina	1	4,300
Far Eastern Republic	19	22,140
	54	$79,583

EXPORTS OF DIESEL AND OTHER HEAVY OIL MARINE ENGINES
January to June, 1922, Inclusive

	No.	Value
England	2	$3,666
France	1	490
Canada—		
British Columbia and Yukon	1	1,052
Quebec and Ontario	1	100
Argentina	2	225
British Guiana	2	230
Philippine Islands	1	220
Japan	10	2,250
Australia	2	1,074
	22	$9,307

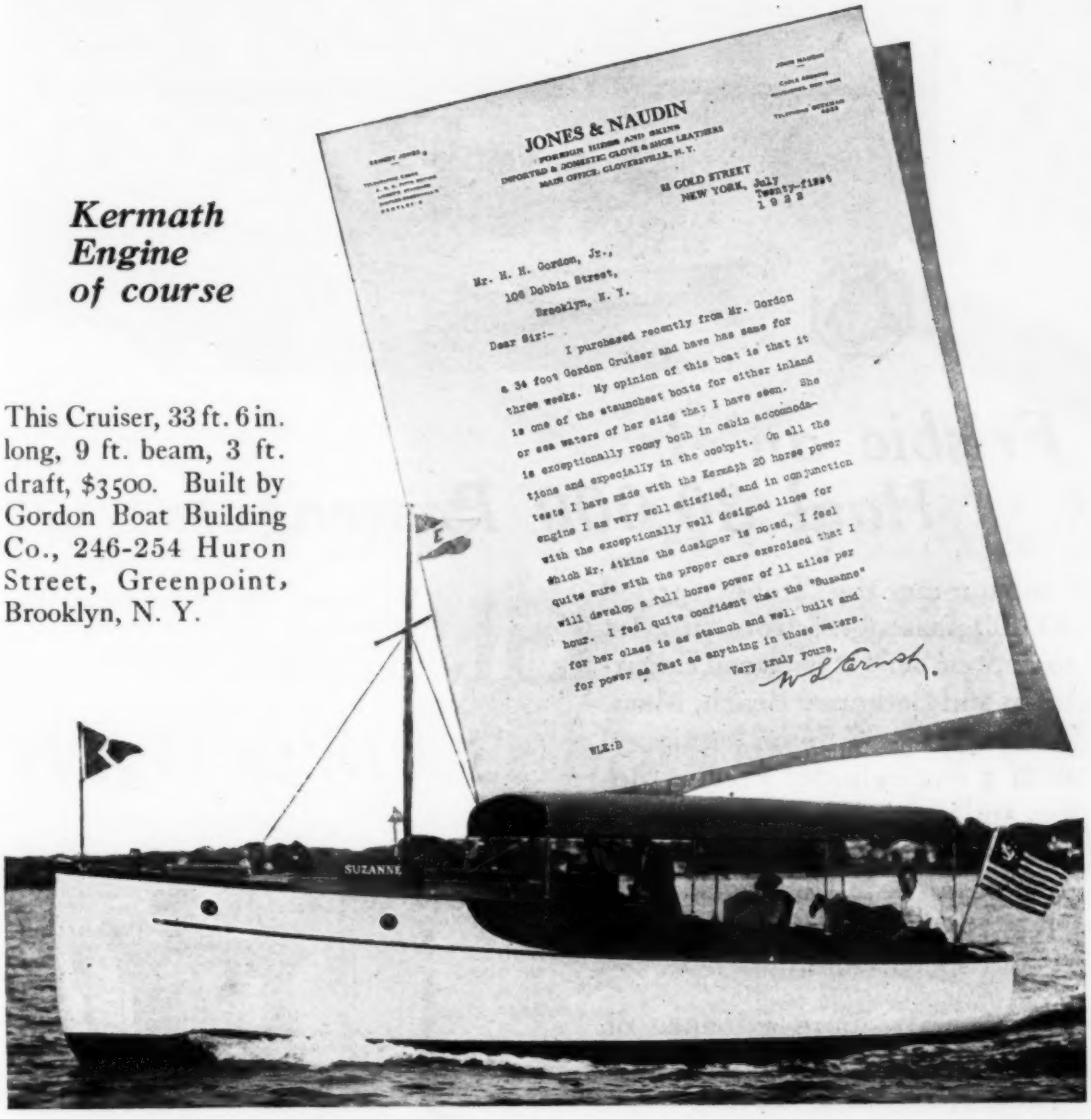
(*Continued on page 132*)

Advertising Index will be found on page 146

Read what this owner has to say of his $3500 cruiser, built by Gordon Boat Building Company, of Brooklyn, N. Y.

Kermath Engine of course

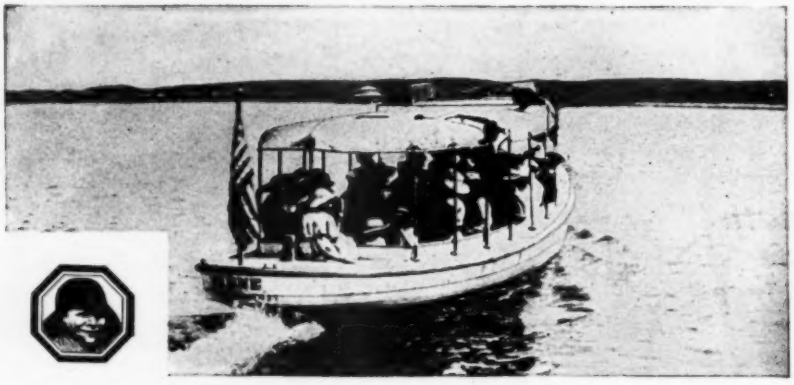
This Cruiser, 33 ft. 6 in. long, 9 ft. beam, 3 ft. draft, $3500. Built by Gordon Boat Building Co., 246-254 Huron Street, Greenpoint, Brooklyn, N. Y.


JONES & NAUDIN
FOREIGN SKINS AND SKINS
IMPORTED & DOMESTIC GLOVE & SHOE LEATHERS
MAIN OFFICE, GLOVERSVILLE, N. Y.
34 GOLD STREET
NEW YORK, July Twenty-first 1922
Mr. H. H. Gordon, Jr.,
108 Dobbin Street,
Brooklyn, N. Y.
Dear Sir:-
I purchased recently from Mr. Gordon a 34 foot Gordon Cruiser and have has same for three weeks. My opinion of this boat is that it is one of the staunchest boats for either inland or sea waters of her size that I have seen. She is exceptionally roomy both in cabin accommodations and especially in the cockpit. On all the tests I have made with the Kermath 20 horse power engine I am very well satisfied, and in conjunction with the exceptionally well designed lines for which Mr. Atkins the designer is noted, I feel quite sure with the proper care exercised that I will develop a full horse power of 11 miles per hour. I feel quite confident that the "Susanne" for her class is as staunch and well built and for power as fast as anything in these waters.
Very truly yours,
W. L. Kermath.
WLK:B
SUZANNE

70% of America's leading boat builders use Kermath Engines as standard equipment

KERMATH M'f'g Co.

DETROIT 5880 Commonwealth Ave. **MICHIGAN.**

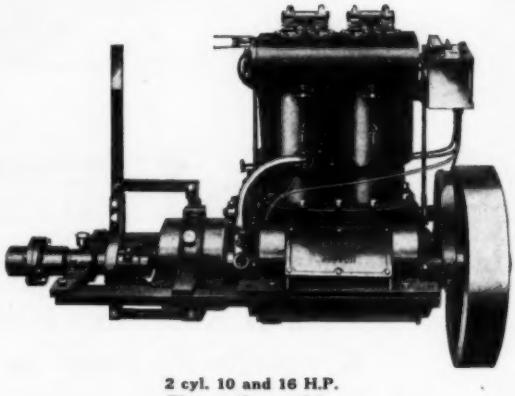


Frisbie an' I Haul 30,000 Passengers

Last summer the "Irene" carried 30,000 passengers from July 1st to September 1st between Edgartown and Bethaney Beach, Mass. This boat is a 37 footer, equipped with a two-cylinder Frisbie Motor, and is doing ferry duty steadily without engine trouble. Her owner, James E. Chadwick, says, "It is a wonderful motor for power and speed."

This is only more evidence of the faithful performance of the "friendly" Frisbie service.

Literature describing all models gladly sent on request.



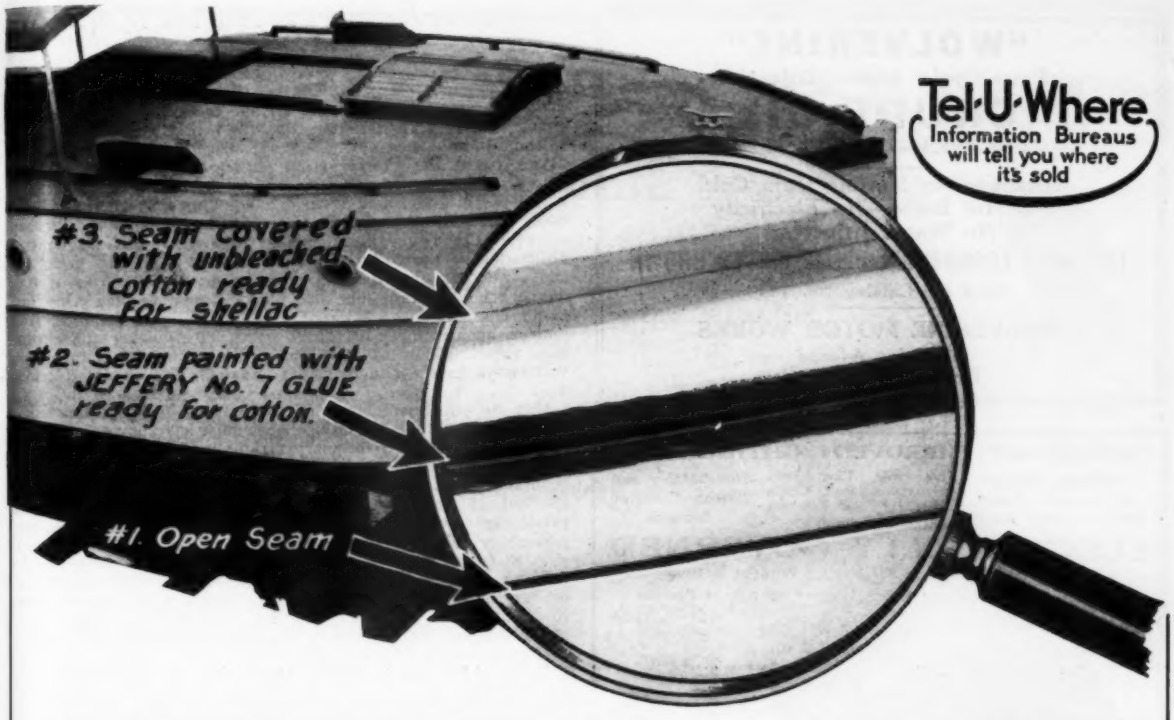
2 cyl. 10 and 16 H.P.
Eleven other models:
1—6 cyl.; 5 to 100 H.P.

The Frisbie Motor Company

7 College Street. Middletown, Conn.

Frisbie VALVE-IN-HEAD MOTOR

Advertising Index will be found on page 146


#3. Seam covered with unbleached cotton ready for shellac
#2. Seam painted with JEFFERY No. 7 GLUE ready for cotton.
#1. Open Seam

Tel-U-Where
Information Bureaus will tell you where it's sold

DOES YOUR BOAT LEAK?

LET US TELL YOU ABOUT JEFFERY'S WATERPROOF MARINE GLUE

The enlarged section of the above illustration shows how the hull seams of a boat can be treated when the owner does not care to go to the expense of covering the entire hull with cotton or canvas as recommended in our booklet entitled, "How to make your boat leakproof."

The lower seam is shown open, as usually is the case when a boat is laid up during the winter, the middle seam is shown painted with a coat of our Jeffery's No. 7 Marine Glue ready for the cotton fabric which is laid on the glue and ironed into it with a warm flat iron as shown on the top seam. The cotton is then given a coat of shellac and painted. When the job is completed according to these directions the patching strips can scarcely be detected.

We however believe and earnestly recommend that if a more permanent result is desired, the entire surface be covered with fabric, land in our Jeffery's No. 7 Black soft quality Marine Glue. This treatment will insure a boat with a coat of paint once a year being absolutely watertight indefinitely.

Send for our booklets, "How to Make Your Boat Leakproof" and "Marine Glue—what to Use and How to Use it"

JEFFERY'S WATERPROOF MARINE GLUE
IN ALL THE VARIOUS GRADES

For sale by all Yacht, Boat and Canoe Supply Houses, Hardware, Paint and Oil and Sporting Goods Dealers.

L. W. FERDINAND & CO., 152 KNEELAND STREET BOSTON, 11, MASS.

"WOLVERINE"
Four Cycle Airless Injection
CRUDE OIL
ENGINES—46 to 95 H.P.
Instantaneous Starting from Cold
No Hot Bulbs—No Electricity
No Water Injection
THE MOST ECONOMICAL PRIME MOVER KNOWN
Send for Catalog No. 141
WOLVERINE MOTOR WORKS
43 Union Avenue
Bridgeport, Conn.

"STEADFAST" IMPROVED LIGHTING UNITS
Uniform Voltage At Variable Speed 1500 to 6000 R.P.M
Generator Armature Directly Driven
Can Apply Belt, Chain or Friction Drive
Non-Battery and Battery-Charging Systems
ELECTRICALLY GOVERNED
Will Operate Lamps or Searchlight Without Battery
Positive Regulation is Assured by the Superior Functioning of Regulator
GENERATOR
$23.00

Capacity 6 or 10 Amps. Volts 6-8
Clamped to Base with Strap
Generator and Regulator Separate Units
Write for full description
HARVEY MACHINE CO.
14th & Los Angeles Streets
Los Angeles, U.S.A.
REGULATOR
$7.50

Volt or Ampere Regulation Adjustable. Controls Generator Field

TOPPAN BOATS
DORIES LAUNCHES ROWING SKIFFS
Sailing Dories Marconi rigged Cat boats
Detachable motor boats.
15 ft. Toppan detachable motor boat $98. Carries 6. With Elto motor, $213.
21 ft. V-bottom Runabout. Universal motor, $1,000.
16 ft. Hydroplane Bullet, famous for its speed and seaworthiness. With Universal motor, $850.00.
22 ft. Cabin Dory, Universal motor, $950.00.
Send for catalog of type boat you want.
TOPPAN BOAT MFG. CO. Dept. M. Medford, Mass.

B. Schellenberg & Sons

EVERYTHING FOR THE PERSON OF THE YACHTSMAN, HIS OFFICERS AND HIS CREW
Clubs, yacht owners, commercial boat owners, should take advantage of our many years' experience in outfitting the mariner, both inland and deep sea.
Crews and Club Attendants furnished without Charge.
B. SCHELLENBERG & SONS
99 to 105 Myrtle Ave., near Bridge St.
Brooklyn, N. Y.
Telephone: Main 0804.

Marine Engines to Aid the Workers

(*Continued from page* 43)

section, doing it cheaper and quicker and better in every way than the railroads could. In certain sections where a boat is almost, as in Venice, a necessity for work or play, we see a splendid development of the work boat; on Puget Sound, the Maine coast, the Florida coast, among the Thousand Islands, etc., a motor boat is the truck and jitney of the water, without which travel and traffic from one point to another would be in many cases not only tedious and slow, but impossible. Perhaps it requires a few railroad strikes to awaken our people to a realization of the truly wonderful waterways of this great land and to the fact that they should be made great arteries of commerce bringing trade—the life blood of our people. One little motor boat can tow a flock of scows loaded with produce, fruit, lumber, manufactured or canned goods, etc., quicker and cheaper than auto truck or railroad train. We do not begin to use our waterways as the Dutch, Danes, English, French and Germans do.

One of our big commercial motor boat fleets is the fishing fleet. To be a success a fishing boat must have power. To make port in time to catch the market right the fisherman cannot depend upon fickle breezes and 23,000 odd fishing craft of the country have internal-combustion engines. Practically only a handful of trawlers and big fishermen have steam and comparatively few craft are purely sail. In addition to towing, passenger, fishing and freight service there are a variety of uses to which motor boats are put, among them being the following; ferry service, charter parties, dredge tending, shipyard or contractors' service launches, inspection work, survey work, lifeboat service, oil tanker service, ice breaking, water boats, ship chandlers' service, yawl boats on schooners, cannery tenders, fire boats, etc, etc.

It would be folly to attempt to mention any particular boat or fleet of boats or any particular engine which is prominent in the commercial motor boat field. Every type of motor is needed in this field, too. While it may be generally stated that the rugged, medium to slow speed, heavy engine is most needed, yet there are fast service launches and taxi service boats which use high-speed engines. In some sections gasolene is available at reasonable price, but for commercial use we favor the kerosene, distillate or oil engine. An engine which will burn either of these fuels can find fuel available anywhere and at all market conditions. Now and then we find a man who installs in his yacht one of the well-known types of engines of the extreme heavy duty model which has made its reputation in the work boat fleet; provided his boat is of the proper type for this engine we believe this is a good engine because engines in the commercial motor boat get a pretty hard service and when they get through they have the rough edges pretty well worn off, so to speak.

One feature of the work boat field of interest to the wide-awake engine manufacturer is the fact that this market is live all the year round; the man who runs his boat for a living does not lay her up for eight months of the year as the average pleasure motor boat is laid up. And the average fisherman or work boat owner is not trying to improve the engine, but lets it alone except to make the adjustments which the engine salesman told him about. This is somewhat in contrast to the average pleasure boat engine which has all the experts at the club making adjustments. Altogether, prospects for business and success in the motor work boat field are good and if engine manufacturers and boat builders will cooperate and devote proper attention to this market we believe that they will be surprised at the results.

Export Conditions and Prospects

(*Continued from page* 128)

Complaint is general here at home of continuing depressed trade. It seems altogether probable that international trade will improve quite as soon and quite as fast as domestic trade. But in view of the fact that foreign business is long distance business that requires a considerable expenditure of time as well as work in development, it is quite impossible for any manufacturer who seeks any foreign business to rest inactive awaiting the high tide of prosperity in international trade. It is sufficiently clear that we are still carrying on our export business and in really very large volume, no matter if it is not the volume of 1916 to 1920. We are retaining a wonderful basis for the development of future export trade. That possibility cannot be neglected today in the hope that by some miracle, when business is good and times are easier, a big volume of business will simply flow in from all parts of the world to our manufacturers. Aggressiveness in seeking, and intelligently seeking, foreign business is more necessary today than ever before.

Advertising Index will be found on page 146

JOES FAMOUS REVERSE GEARS

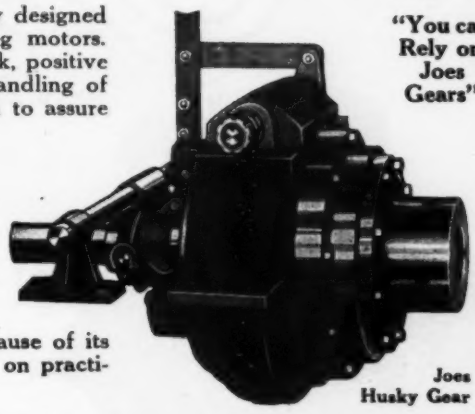
80% - 88% REVERSE SPEED RATIO

A POWERFUL reverse is a most vital consideration in buying a reverse gear, particularly for work boat service. The **high reverse speed ratio** of Joes Gears gives you practically the **full power and speed** of your motor for a quick, vigorous back-up.

Joes Husky Gear is a big, powerful gear especially designed for heavy duty Diesel, semi-Diesel and oil-burning motors. Its high ratio of reverse speed (85%) gives the quick, positive power on the reverse necessary for the efficient handling of heavy work boats. All parts are of extra strength to assure long and unfailing service.

Joes Improved Duplex Drive Gear is suitable for all classes of commercial and passenger boats, and for medium and heavy duty work boats. Its **88% reverse speed ratio** can be depended on for a quick reverse in an emergency, and makes the handling of your boat easier in the regular course of the day's work. It has also proved the most successful gear on the market for racing boats because of its compactness, great strength and reliability. Used on practically all famous racers.

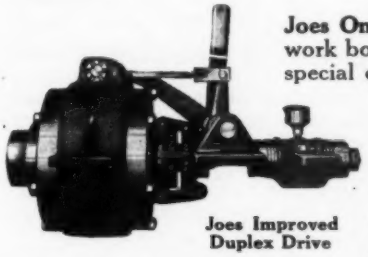
"You can Rely on Joes Gears"



Joes Husky Gear

Joes High Power Gears are perfectly adapted for unit installation on light motors, and for all sorts of general work where light or high speed motors are used.

Joes Enclosed Gear is a complete reverse gear unit of the "High Power" type. Rear and thrust bearings complete are incorporated in the housing, and it is provided with a steel flange at each end.



Joes Improved Duplex Drive

Joes One-Way Clutches are especially designed for fishing and other work boats where a one-way clutch is preferred to a reversing gear. A special design for hydroplanes and other speed craft combines great strength and lightness in small compass.

Joes Safety Rear Starter is a positive protection against injury in cranking.

You Can Have a Joes Reverse Gear on Any Motor

Many manufacturers of high grade motors now furnish Joes Reverse Gears as regular equipment. Any motor manufacturer will equip your new motor with Joes Reverse Gear if you specify it; or you can have Joes Gears put on your present motor.

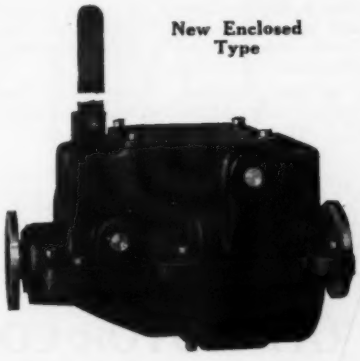
The Snow & Petrelli Manufacturing Co.

156-B Brewery St. **New Haven, Conn.**

Joes Distributors and Service Stations

New York—Sutter Bros., 44 Third Ave. Service Station Foot of East 92nd St., Brooklyn.
Philadelphia, Pa.—W. R. Gochenaur Mfg. Co., 631 Arch St.
Baltimore, Md.—Unger & Mahon, Inc., Pratt and Gay Sts.
Detroit, Mich.—Henry H. Smith & Co., 252 Jefferson Ave., East.
Cleveland, Ohio—Wm. F. Meier, 1433 W. 77th St.
Chicago, Ill.—W. L. Masters & Co., 229 North State St.
New Orleans, La.—Arthur Duvic's Sons, 130 Chartres St.
Southern California—Fellows & Stewart, Inc., Wilmington.
Seattle, Wash.—Pacific Marine Engine Co.
Toronto, Canada—A. R. Williams Machinery Co.
Montreal, Canada—E. Drolet, 137 McGill St.
Newfoundland—John Barron & Co., 241 Water St., St. John.
New Brunswick—P.E.I., T. McAvity & Son, St. John, N. B.
England—J. King & Co., 10 Church Row, Limehouse, E. London.
Turkey—Societe Generale d'Automobiles, Constantinople.
Argentine, S. A.—J. Banham & Sons, Buenos Ayres.

New Enclosed Type



Gray

VALVE-IN-HEAD MOTOR

Operates on Gasoline Distilate or Kerosene

10 to 25 H. P.

A Clean—All Enclosed Motor—Yet Accessible

OUR sixteen years experience in maintaining an exclusive Export Department, studying the details that are so necessary in giving excellent service to all our Foreign friends and from the fact Gray Engines are in satisfactory every day service throughout the world insures your business being properly taken care of.

The new Gray 4-cylinder, 4-cycle engine has 1922 engineering features, guaranteeing long life, economy and dependability. It is suitable for runabouts 20 to 30 ft. in length; small cruisers up to 34 ft., also work boats. Note the rigid one-piece base with reverse Gear enclosed.

The Gear is automatically lubricated with positive gear pump that lubricates all other internal working parts of the engine—no grease cups or thick transmission oil used.

Oil filler is conveniently located on top of engine with duct leading to Crank Case. Rocker arm shaft is hollow and automatically supplies oil to Rocker Arms. Oil is forced under pressure to the three main bearings, and to the connecting rod troughs.

In brief, the Gray Oiling System leaves nothing to chance. It is unfailing at all engine speeds, and all oil is kept inside the engine, and not thrown around the boat or on its occupants.

The fly wheel is enclosed, affording *safety* and *cleanliness*. Bilge water cannot be thrown by the fly wheel. Every working part is enclosed; even the push rods. Due to the special design of the Cam Shaft, push rods and rocker arms, scarcely a sound can be heard with the ear close to the engine.

Its smooth, quiet operation at all speeds from 200 to 2,000 would compare favorably to an electric motor.

This Gray Improved Valve-in-Head operates most economically on the low grade gasoline and satisfactorily on kerosene.

The diameter of the main bearings are:

Front 2⅛". Centre 21/16". Rear 2". The lengths are 3⅜", 2½", 2½" respectively.

Crank shaft is 40-50 point carbon steel forging, heat treated and ground.

Special attention is given to the balancing.

Bosch Magneto with Impulse Starter, also Bosch two unit Starter and Generator is used.

Write for FREE Literature

Gray reliable Two-Cycle Motors are built in models from 3 to 8 h.p.

Prices Low—Consistent with Quality

GRAY MOTOR COMPANY, 2106 MACK AVE., Detroit, Mich.

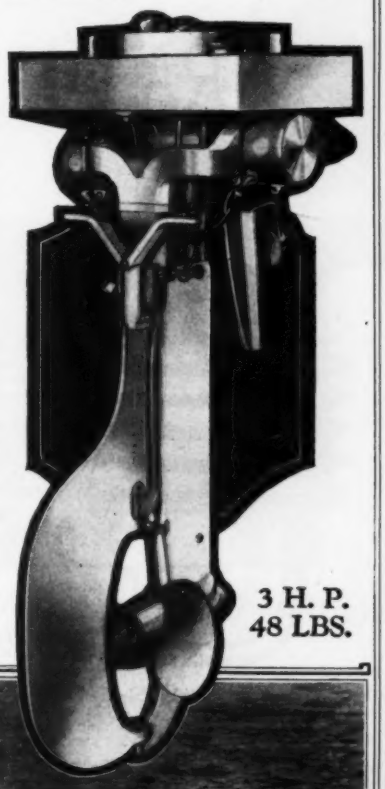
Advertising Index will be found on page 146

The FASTEST Outboard Motor

Elto

LIGHT TWIN

Designed by Ole Evinrude



3 H. P.
48 LBS.

"AN easy victory for Elto"—that's the report from dealers and users wherever the Elto Light Twin is permitted to enter outboard motor races. Elto has firmly established its reputation as the ***fastest outboard motor.***

Because of its great power and speed, the Elto Light Twin is barred from many races, the committees contending the Elto is no fair match for single cylinder or even many double cylinder motors. In many races the Elto has been handicapped several minutes to offset its advantage in speed.

At the Milwaukee Regatta, in connection with the world convention of advertising men, the Elto out-distanced motors of competitive makes ½ mile on a 2½ mile course. At other important racing events, Elto has achieved similar success. ***Wherever stock motors are raced,*** the exceptional speed of the Elto makes it an easy winner.

In buying a motor, your interest lies in what STOCK models will do. That's why your choice should be Elto, Ole Evinrude's latest motor—conceded to be the fastest outboard motor, yet it weighs but 48 pounds and is extremely compact. The Elto develops full 3 horse-power. Built with minute precision. Sturdy, rugged, will outwear motors twice as heavy.

The many improved Elto features are a revelation to the outboard motorist. The Elto starts instantly in all weather. Smooth, quiet performance, no vibration. Perfect trolling speed. Motor tilts, can go safely anywhere. Steers from any part of boat. Folding rudder. Underwater exhaust. Weedless construction.

For complete information and name of your nearest Elto dealer, write to Ole Evinrude's new organization—

Elto Outboard Motor Co., Dept. F., Mfrs. Home Bldg. Milwaukee, Wis.

RAJAH SPARK PLUGS

make

Ignition Absolutely Sure

Rajah Terminal with every plug without extra charge

DON'T take chances with ignition trouble. Your boating hours are all too short to waste time on faulty spark plugs. Buy the best—RAJAH Spark Plugs—they cost no more.

For more than twenty years RAJAHS have been proving that they are better spark plugs—better design, better materials, more careful workmanship, more exacting inspection before they leave the factory. No wonder they give better service. One set of Rajah plugs frequently lasts five to seven years in the same motor.

For outboard motors and all other exposed marine engines, the Waterproof Rajah Spark Plug is best. The porcelain is protected by a moulded Condensite cap. Over this is a flexible rubber nipple that extends well over the insulation on the cable. This plug is absolutely waterproof, shockproof and breakproof. Neither rain, spray nor solid water can put it out of commission.

Standard Rajah Plug...$1.00
Giant Rajah Plug..... 1.25
Waterproof Rajah Plug. 1.25
Complete with Terminal

If your dealer doesn't sell genuine Rajah Spark Plugs, order direct from us stating thread wanted. Most good marine dealers sell them.

These are the celebrated Rajah Terminals

Thumb Nut — with all Rajah plugs unless other type preferred. 10c each

Regular Fits any size cable 10c each

Thrust 10c each Furnished with ferrules to fit any size cable

Keeps connections dry Protects against shocks Fits any plug or coil 15c each

Thrust Clip **Hook Clip** **Ring** **Assembly to Cable**

Rajah Solderless Terminal 15c ea.

Rajah Auto Supply Co., Bloomfield, N. J., U. S. A.

Advertising Index will be found on page 146

Mercator Sailing

(*Continued from page* 37)

longitude might be preserved throughout in all particulars.

Constructing a Mercator chart. It is often supposed that the construction of a Mercator chart is a problem of considerable complexity. In fact, it is simplicity itself. Perhaps the best way to explain is to illustrate, and so let us take a problem.

Example 48: Construct a Mercator chart from Lat 39° N to Lat 42° 15′ N, and from Long 16° 30′ W to Long 20° W.

Instruments required. These may be elaborate or simple. The most important are a hard pencil *with a point on it,* and a ruler, preferably an engineer's rule, with scales divided decimally, that is, into 10ths, 20ths, 30ths, etc. The engineer's rule is a convenience merely; not a necessity. With its many scales, it is easy to select a suitable one. For instance, if our longitude scale is to be an inch to the degree, the 60th divisions on the rule would give single minutes. With two inches to the degree, the 30ths scale would give single minutes, and so on. But with a rule divided into 8ths or 16ths, we can still make out, by adopting such scale for the chart that each division of the rule will have a certain longitude value. Thus, each ⅛ or 1/16 might represent 1′ or 5′ or 10′, or any value desired. A drawing board, with a draftsman's T square, are a great help in drawing parallels and meridians, but the ordinary parallel rules will fill the bill. A pair of compasses, or dividers, come in handy; and a pair of proportional dividers may be used to advantage. But in default of these fine tools, in a pinch, a carpenter's rule and a burnt match will do!

The scale of the chart. The first thing is to determine the scale of the chart. Methods are given for fitting a chart, covering a certain number of degrees, onto a paper of limited size. (See Bowditch, p. 21.) This is all very well for chartographers. But for the navigator it is usually unnecessary. If he requires a large scale plotting sheet, such as four inches to the degree of longitude, he must start with enough paper. If his paper is limited, with half an eye he can perceive the approximate scale which must be used. For instance, in the above problem, we require a chart extending through 3° 30′ of Long, and 3° 15′ of Lat. Suppose our available paper is a sheet 8 x 10 inches in size. Obviously, if we make each degree of longitude two inches long, the entire D Lo would be seven inches, which would nicely fit the paper, with enough left over for margins. Probably it would serve our purpose quite as well to adopt this convenient scale of two inches to the degree, as to make each degree two inches and a fraction, so as to precisely fill up the paper. If we were to cover say 6½ degrees on the same paper, we could adopt a scale of one inch to the degree, or if we were to cover only two degrees, we might make each three inches long, still preserving enough for margin. For practical purposes, we may adopt any scale of longitude found convenient, bearing in mind the requirements of our purpose and the limitations of our available materials, and it will probably be found that our convenient scale will do quite as well as, and perhaps a little better than, one computed to fit the paper to a hair! Incidentally, this method saves a lot of bothersome computation. In the above problem, we shall adopt a scale of two inches to the degree of longitude.

Now draw the lower inner neat line, or base line of the chart, leaving a respectable margin at the bottom of the paper. (See Fig. 27.) For the 30′ or half degree, measure off one inch at the right hand end, and subdivide the rest of the line into two-inch spaces. Next erect a series of perpendiculars, one at each division, to represent the meridians. No particular care need be exercised as to the length of these lines. They may be drawn the full length of the paper, if desired. Any ends left over may be erased later.

Next we may cut in the longitude scale, by subdividing the base line into whatever number of divisions may be required. With the engineer's rule, this is easily done, for, according to our adopted scale, the 30ths divisions on the rule would give single minutes of longitude. Of course, it is unnecessary to subdivide the entire base into single minutes. We might divide it into five or ten-minute spaces, and then subdivide one of these only into minute spaces.

Now comes the matter of ruling in the parallels of latitude. These must be spaced increasing distances apart, as we depart from the equator, as above explained. The table of meridional parts supplies the necessary data. (Bowditch Table 3.)

Turning to Table 3, p. 621 et seq., it will be seen that each page contains a number of columns, numbered 0°, 1°, 2°, 3°, etc., one column for each degree of latitude. The black face numbers at the top of the column stand for latitude degrees. At each side of the page are columns headed "M", and numbered from 0 to 59. These columns are used for obtaining the meridional parts where the quantities involve degrees and minutes. Suppose we wish the meridional parts for 8°. We find it on page 621, at the top of the column headed 8°, 478.3 being the figure sought. If we wished the parts for 8° 43′, we would run down either one of the "M" columns to 43, and opposite 43, but under the same 8° column, we would find 521.5, which are the meridional parts for 8° 43′. It will be noted that the figures in the table are given in decimals, to the nearest one-tenth.

In our problem, the latitude extends from 39° N to 42° 15′ N. Thus, take out the meridional parts for these latitudes, as follows:

Lat	Merid. Parts	Difference
39°	2530.2	
40°	2607.6	77.4
41°	2686.2	78.6
42°	2766.0	79.8
42° 15′	2786.2	20.2

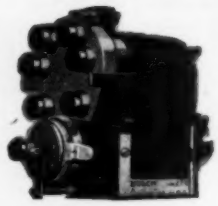
Consider, now, what these differences really mean. A degree of longitude on the equator is 60′ equaling 60 miles. On the Mercator projection, the meridians are parallel, and thus have the same space between them in every latitude. Now, if we had a surface large enough upon which to draw a full sized Mercator projection, the meridian from Lat 39° to 40° would actually be 77.4 miles long. Of course, we cannot draw to any such huge scale, but we can represent the proportions of this scale on a sheet of paper. Whatever scale we adopt to represent a minute of longitude, it will take 77.4 of these minutes to represent the space between the 39th and 40th parallels on the chart. In our drawing, we have adopted 1/30 of an inch for a minute of longitude, and the expanded meridian from 39° to 40° would be 77.4 x 1/30 of an inch, or 2 inches plus 17.4 of these minute divisions. With our engineer's rule, we may measure up on one of the meridians, starting, of course, from the bottom inner neat line, and lay off 77.4 of these divisions, or minutes of longitude. Or, since we have the base line all divided, we might set our dividers to cover 77′.4 on the longitude scale, and lay this distance off on the meridian. Through this point, draw a line parallel with the base, and the first latitude parallel is in. Proceed in the same way as to the remaining ones, using, of course, the proper meridional difference of latitude for each degree in laying off the successive parallels.

The frame of the chart is now complete. It remains, however, to subdivide the latitude scale at the side of the chart. This is the only tedious part of the operation. It is tedious, because the space between each degree of latitude, from the equator up, is different; and generally runs into some outlandish fraction of an inch; and it is difficult to divide such quantities into 60 or some aliquot part of 60, equal spaces. Of course, they must be so divided, because the degree of latitude always contains 60′.

Perhaps the easiest way to make this subdivision is by constructing a proportional scale, such as represented in Fig. 28. Anybody can make one on a sheet of cardboard, and it will last indefinitely. Generally it would be unnecessary to have more than twelve spaces on this scale, each space representing 5′ divisions. Of course, the scale may be made to contain any number of divisions desired. The scale may be used by sliding it under the edge of the paper on which the chart is drawn, until the outer oblique lines of the scale exactly coincide with the places where two

(*Continued on page* 138)

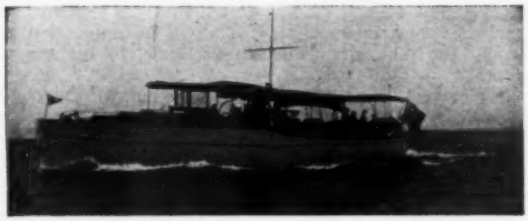
BOSCH



This trade mark on a starting, lighting or ignition unit or part stamps it as a genuine Bosch Product—backed by the Bosch guarantee of dependable service.

Trade Mark

American Bosch Magneto Corporation
Springfield, Mass., U. S. A.



BUILD YOUR OWN BOAT from our K. D. frames

Sixty standard designs, the product of 20 years' experience, for you to choose from.
New plant of four times former capacity. Our new literature on knock-down boats sent on request.

DEFOE BOAT & MOTOR WORKS
1251 Jefferson St. Bay City, Mich., U. S. A.

Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of MoTOR BoatinG, December, 1907, hundreds of Curtiss Fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

"PRICES ON APPLICATION"

18" x 18" x 11"
The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

THE J. H. CURTISS CO.
2 South Street, New York

More Speed Guaranteed

Let us increase your boat speed with a

B & B Propeller

We are so sure that the celebrated B & B Propeller will make your boat go faster that we positively guarantee it to increase your speed from one to three miles per hour.

Excellent materials and workmanship together with scientific design is the reason for the wonderful efficiency of B & B Propellers. They are different.

Any size and pitch up to 30" dia. in stock.

Write Today for Catalog

BRYANT & BERRY PROPELLER CO.,
1202 Lillibridge St., Detroit, Mich.

New York Representatives: E. J. Willis Co., 85 Chambers St., N. Y. C.
Canadian Sales Agents: Canadian Fairbanks Morse Co.

Mercator Sailing

(*Continued from page* 137)

parallels cut the edge of the paper. The intermediate lines of the scale then subdivide the space between the parallels into equal parts.

The subdivision may also be made with a pair of proportional dividers. Set the dividers so that when one end is opened to cover a degree on the longitude scale, the other end will cover a degree between the two parallels. With the dividers so set, the divisions of the longitude scale may be transferred to the side of the chart, expanded in proper proportion.

Or again, the division may be made by drawing a diagonal, as indicated, at the right of Fig. 27 between Lat 40°-41°. This diagonal may be drawn in any convenient direction, its angle being immaterial. Point off on the diagonal as many equal spaces as you wish divisions on the latitude scale. The length of these spaces is likewise immaterial, except that they must all be equal. Then draw a line from the last point to the place where the meridian and parallel intersect, and draw other lines, parallel with the first, one line through each point, as indicated. Of course, it is unnecessary to actually draw these lines. The various points may be indicated by dots, easily erased after the latitude scale has been marked on the chart.

Still another way of making the division, is to lay the ruler diagonally across the two parallels, placing the 0 of the rule on one parallel, and swinging the other end until an easily divisible number of divisions on the rule cuts the other parallel. Suppose we wish to divide the latitude scale into six parts, representing 10′. Now 6 is divisible into 12, 18, 24, 30, etc. Take, for instance, the scale of tenths on the rule. Place the 0 on one parallel, and orient the rule so that the other parallel cuts the 30, or 3 inch, division on the rule. $30 \div 6 = 5$. Then every 5 spaces on the rule, place a dot on the paper, and carry out parallel lines to the side of the chart. This method is illustrated at the right hand side of Fig. 27 between parallels 41° and 42°.

The foregoing completes the chart. If desired, the lines may be neatly inked in, the divisions of the scale may be blocked out, and borders added. Also the meridians and parallels should be numbered. But be sure to number them in the right direction. In North latitude, the numbers representing latitude increase from the bottom of the chart upward; in South latitude, they increase from the top of the chart downward. In West longitude, the numbers increase toward the left; in East longitude, toward the right.

Geographical features may be added by indicating, by dots on the chart, the latitude and longitude of various points along the coast; and the shore line between them may be faired in, freehand.

The solution of a Mercator problem. In the conventional dead reckoning triangle, the adjacent side represents DL; the opposite side Dep. With the DL and Dep given, the triangle is solved by plane trigonometry, the fundamental formula being:

$$\tan C = \frac{\text{Dep}}{\text{DL}}$$

From which we derive:

$$\text{Dep} = \text{DL} \tan C$$

$$\text{DL} = \frac{\text{Dep}}{\tan C}$$

In the Mercator triangle, the adjacent or DL side has been expanded into the meridional difference of latitude (MDL or m), and the Dep or opposite side has been lengthened to represent the difference of longitude. But the solution is likewise by plane trigonometry, and the formulæ are the same, except that the names of the sides of the triangle are changed. MDL or m is substituted for DL, and D Lo for Dep. Thus the fundamental formula is:

$$\tan C = \frac{\text{D Lo}}{\text{MDL}}$$

From which we derive:

$$\text{D Lo} = \text{MDL} \tan C$$

$$\text{MDL} = \frac{\text{D Lo}}{\tan C}$$

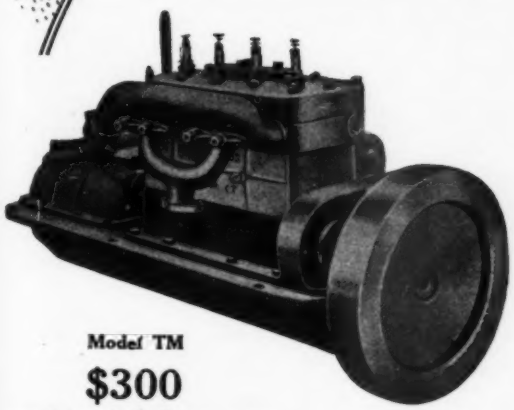
(*Continued on page* 140)

Advertising Index will be found on page 146

PALMER ENGINES

TRADE MARK REG. U.S. PAT. OFF.

Another New Palmer—8-10 H.P. $300 Complete



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The secret of Palmer success lies in the low prices at which these motors are sold, combined with their known reputation for quality construction and reliable performance. For example, this new model T M Palmer is as fine a little four cylinder, four cycle motor as can be built. The price of $300 covers the complete motor, including spark plugs, carburetor, magneto, muffler and reverse gear.

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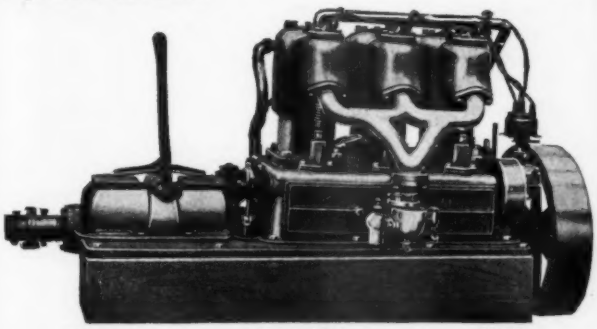
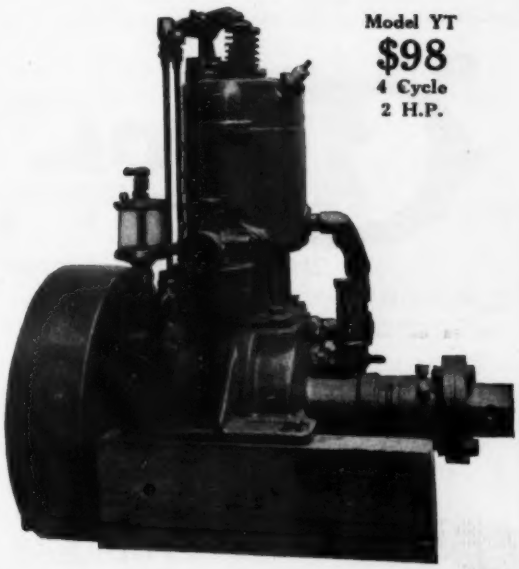


NR-2	10-12 H.P.	$425
NR-3	15-18 H.P.	$600
NR-4	20-24 H.P.	$775

Model YT

$98

4 Cycle
2 H.P.



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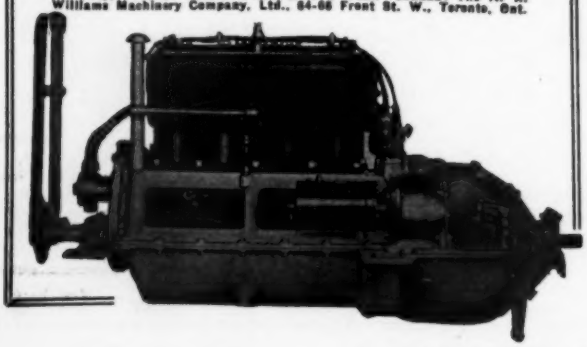

Mercator Sailing

(*Continued from page* 138)

The solution throughout, whether by computation or traverse table, is the same as in plane sailing, except for a mere substitution of terms.

Instead of DL, use MDL, and find D Lo, instead of Dep.

Instead of Dep, use D Lo, and find MDL, instead of DL.

Thus we have the following rules for solving the problem by inspection:

Case 1. Given the Course and MDL to find the D Lo: Go into the traverse table with the course. Against the MDL in the Lat column, find the D Lo in the Dep column.

Case. 2. Given the MDL and D Lo to find the course: Go into the traverse table with the MDL in the Lat column, and the D Lo in the Dep column. On the page where they most closely agree, read the Course.

Remember that Mercator sailing does not give distance. Never look for the distance opposite the MDL in the table. Mercator sailing will give the course. But it then becomes an ordinary plane sailing problem to find the distance, using, with the course, the proper difference of latitude or the departure.

Example 49. Vessel in Lat 27° 13′ N, Long 49° 16′ W sails Course 63°, Dist 317 miles. Required, the Lat and Long in, by Mercator sailing.

By computation

First step: Find the DL by plane sailing.

Formula: DL = Dist cos C.

Dist	317	log	2.50106
cos C	63°		9.65705
DL	143.9		2.15811
=	2° 23′.9 N		
Lat left	27° 13′ N	Mp (Table 3)	1687.4
Lat in	29° 36′.9 N	Mp (Table 3)	1850.2
		M D L	162.8

Note: The meridional parts are taken from Table 3, and set opposite the Lat left and the Lat in. The difference between the meridional parts for the two latitudes is the MDL.

Second step: Having found the DL by plane sailing, and the MDL from Table 3, the D Lo is then found by Mercator:

Formula: D Lo = M D L tan C

M D L	162.8	log.	2.21165
tan C	63°		10.29283
D Lo	319.5		2.50448
=	5° 19′.5 E		
Lo left	49° 16′ W		
Lo in	43° 56′.5 W		

By inspection

First step: Table 2, p. 585, C 63°, reading from bottom, with Dist 317 = D L 143.9 = 2° 23′.9 N.

Lat left	27° 13′ N	Mp	1687.4
D L	2° 23′.9 N		
Lat in	29° 36′.9	Mp	1850.2
		M D L	162.8

Second step: Table 2, p. 585, C 63°, reading from bottom, with MDL 163.0 in the Lat column, giving Dep 319.9 = D Lo 5° 19′.9 E.

Example 50. From Levuka, Ovalau, Fiji Islands, to Honolulu, Reef Light, Hawaiian Islands. Required, Course and Dist by Mercator.

For positions of Honolulu and Levuka, see Bowd. pp. 344, 347.

First step: Find LD, M D L and D Lo.

Levuka—					
	Lat 17° 40′ 45″ S	Mp	1071.0	Long 178° 49′ 00″ E	
Honolulu—					
	Lat 21° 17′ 55″ N	Mp	1299.9	Long 157° 51′ 54″ W	
DL	38° 58′ 40″	M D L	2370.9	336° 40′ 54″	
=	2338.7 N			360°	
				23° 19′ 06″	
				= 1399.1 E	

(*Continued on page* 142)

Advertising Index will be found on page 146

"Does She Go? I'll Say She Do! That Universal Engine Is a Winner"

It takes the young bucks to know what a real motor boat engine is. Just get hold of one who has a Universal engine for the first time and see him brag. The Universal gives him a boat with a "thrill" to it—a baby that steps right out in front and shows her heels to the whole bunch.

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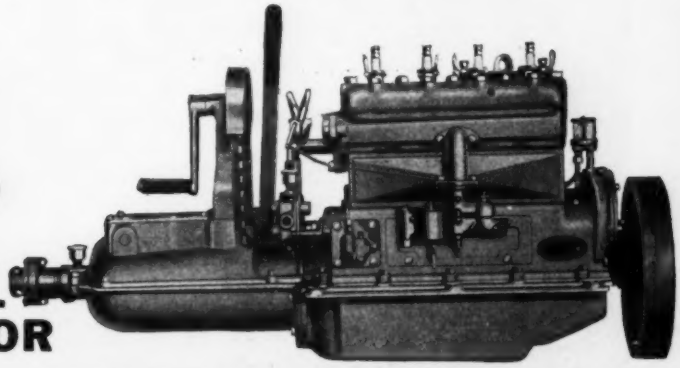
9-12 H. P.
MARINE MOTOR



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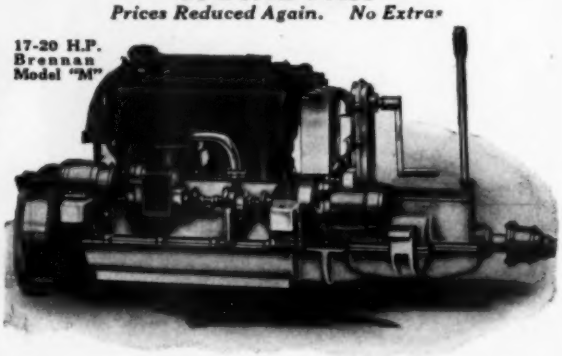

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At our new reduced prices this completely equipped motor, including electric starter, costs you no more than an ordinary motor without equipment.

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Ask Your Dealer

COES WRENCH COMPANY WORCESTER MASS.

Mercator Sailing

(*Continued from page 140*)

Note: The Lats being one N, the other S, the DL is their sum, and the MDL the sum of the meridional parts. Where the longitudes are E and W, the D Lo may be found by subtracting their sum from 360°, or by taking the sum of the difference between each given Long and 180°.

Second step: Find the Course, by Mercator.

By computation

Formula: $\tan C = \frac{D\ Lo}{M\ D\ L}$

D Lo	1399.1 E	log.	3.14585
M D L	2370.9 N		3.37491
C,	N 30° 33′ E		9.77094

Third step: With DL and Course, find Dist by plane sailing.

Formula: $\text{Dist} = \frac{D\ L}{\cos C}$ or $D\ L \sec C$

DL	2338.7 N	log.	3.36897
sec C	30° 33′		10.06490
Dist	2715.6		3.43387

By inspection

In this example, the numbers are large, but may be brought within the limits of Table 2 by moving the decimal point one place to the left, thus dividing by 10.

Table 2, with D Lo 140 in Dep column and MDL 237 in Lat column, nearest agreements are:

p. 590	C 30°	Lat 237.3	Dep 137.0
p. 592	C 31°	Lat 237.4	Dep 142.7

Make course 30° 30′.

With proper DL 234 and C 30° Dist = 270.2. With C 31° Dist = 273.

For C 30° 30′ Dist = 271.6 x 10 = 2716.

Utility of the Mercator method: Mathematically, the Mercator method is highly accurate, and easily solved. Courses crossing the equator are worked as readily as those confined to latitudes of a single name. There are but two limitations on the method: First, it may not be employed in polar regions, for there the expansion of the meridian becomes too great. Indeed, the meridional parts are not computed beyond 80°, which is deemed the greatest practicable limit. (Bowditch, Table 3.) Secondly, the Mercator method should not be employed where the course angle is very large, exceeding, let us say, 80°. The reason is that the Mercator problem is solved by the tangent formulae, and the tangents of very large angles are very large, and change very rapidly, and even slight errors in the meridional difference of latitude or course, become greatly magnified in the final result. The difficulty is due to no fault in the Mercator theory, but to the fact that dead reckoning quantities are always subject to considerable error. In dead reckoning, we deal with more or less approximate quantities. Now suppose the case of a large course, with a slightly erroneous meridional difference of latitude, to find the difference of longitude. The formula is: MDL tan C = D Lo. But the angle is large, and the tangent is large. Thus the slight error in the MDL is multiplied by a large figure, resulting in a large error. Again, suppose the course to be slightly erroneous. The tangents of large angles change rapidly, and the slight error in the course, will make a big difference in the tangent. When the MDL is multiplied by this highly erroneous figure, there will be a highly erroneous D Lo.

To illustrate, take a MDL of 139, and a course of 85°, to find the D Lo. We have:

MDL	139	log.	2.14301
tan C	85°	log.	11.05805
D Lo	1589	log.	3.20106
=	26° 29′		

(*Continued on page 144*)

Advertising Index will be found on page 146

Schooner Yacht "*Goodwill*"

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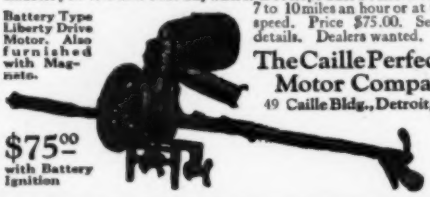

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SILENCE your MOTOR EXHAUST
without loss of power from BACK PRESSURE

The Tvedt Adjustable Marine Muffler will do this.

Adjusted with the motor in actual operation.

Motor Tests have conclusively shown absolutely no loss of power or speed when using this muffler.

Write for Descriptive Catalog and help to eliminate in your harbor the nuisance of motor exhausts.

Built in sizes for 1½ to 5" exhaust connections.

TVEDT-SMITH CO. **Worcester, Mass.**
New York Office, **103 Franklin St.**

Mercator Sailing

(*Continued from page 144*)

Now fancy our MDL to have been in error by 5 meridional parts. Then we have:

MDL	134	log. 2.12710
tan C	85°	log. 11.05805
D Lo	1532	log. 3.18515
=	25° 32′	

The error of only 5 in the MDL, here makes an error of 57′ in the longitude.

Again, suppose the MDL to be accurate, but the course to be a degree out. Then we have:

MDL	139	log. 2.14301
tan C	86°	log. 11.15536
D Lo	1988	log. 3.29837
=	33° 08′, an error of 6° 39′.	

Assuming errors in both MDL and Course, the possibilities of error in the result become shocking.

Now the Middle Latitude method would give no such errors; not because it is inherently more accurate, but because the problem is solved from different elements and with different formulae. The D Lo is not found from the MDL side of the triangle, and with the tangent formulae; but from the Dep side, and with the secant formulae. The Dep is not multiplied by the tangent of the Course, but by the secant of the middle latitude. Now the middle latitude is usually a small, or, at least, a moderate sized angle, generally not over about 45° or 50°, and never very large, for it is not the fashion to make voyages in the polar regions. The secants of such angles as would represent the middle latitude, in any practicable problem, would change slowly, and thus a small error in the Dep or Mid Lat would induce but small error in the final result.

We may adopt the rule that if the course angle exceeds, say 80°, the Middle Latitude method is to be preferred over the Mercator.

Examples for Practice

NOTE: In some of the following, as in other problems throughout these lessons, departures are taken from, or courses laid to, positions which may be on the shore, or in otherwise unnavigable locations. This does not hurt the problems for practice purposes. In actual work, however, proper offings would be generally allowed for. And yet in obtaining the course to be made good on a long voyage, it would ordinarily make little difference whether it were computed from the position of an object on the shore, such as many of those given in Appendix IV of Bowditch, or from a position on the water a couple of miles off. Slight variances of this kind are of trifling moment, when spread over great distances. But they must not be overlooked when the land is close aboard.

Example 51: Vessel takes departure from Cape Race, Newfoundland, and sails S 39° E 429.7 miles. Required, Lat and Long in, by Mercator. (Ans., Lat 41° 05′.5 N, Long 46° 50′.3 W.)

Example 52: From Fayal Island Channel, Azores, N. Magdalen Rock, to Fastnet, England. Required Course and Dist by Mercator. (Ans., C, N 46° 09′ E, Dist 1113.2.)

Example 53: From Cape of Good Hope, Africa, vessel sailed N 43° W, Dist 629 miles. Find Lat and Long in, and Course and Dist from position so found to St. Helena Island, by Mercator. (Ans., Lat in 26° 41′.2 S, Long in 10° 13′.3 E. Course to St. Helena, N 54° 10′ W, Dist 1103.8.)

Example 54: From Midway Islands Lighthouse, Sand Island, sail to Lat 20° 17′ N, Long 178° 20′ E. What is Course by Mercator and Dist? From last position, sail S 62° E, 597 miles. What is Lat and Long in, by Mercator? (Ans., Course, S 26° 29′ W, Dist 532.2; position in, Lat 15° 36′.7 N, Long 172° 29′.1 W.)

Advertising Index will be found on page 146

Sweeping Victories!

Not content with winning nearly every outboard motor race of the year, the Evinrude Motor in most events has made a clean sweep—taking from the first three to the first eight places. Decisive victories at Peoria, Ill., Madison, Wis., Sandusky, Ohio, and at scores of lakes and river resorts throughout the country prove the Evinrude to be without question the speediest of outboard motors.

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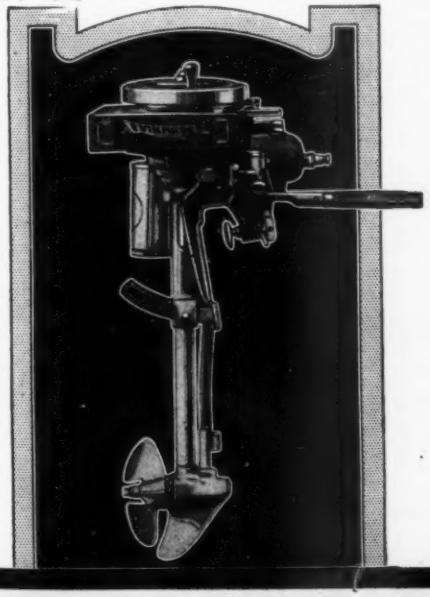

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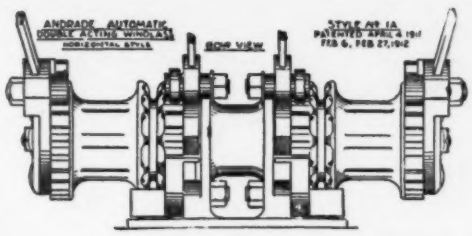

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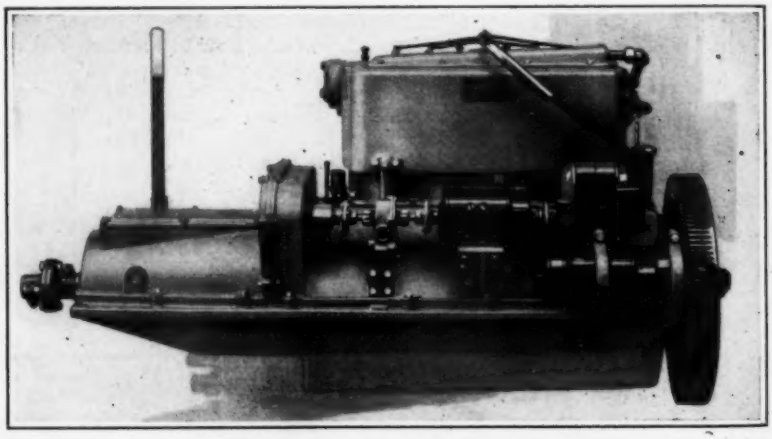

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